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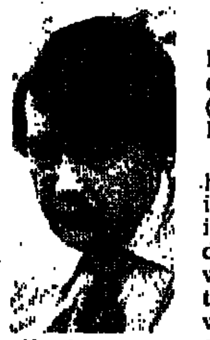
Modcomp founder resigns

FOUNDER and president of Modcomp Ken Harple resigned suddenly last week for "personal reasons," and the senior vice-president of finance, Alexander Giles, has taken over as president.

The Fort Lauderdale, Florida-based minimaker is currently the subject of two offers by unnamed companies. A large international company wants to buy control of Modcomp, and a US company wants a 20% stake.



Harple

Modcomp declined to name either company, but Wall Street observers believe they are GEC and Gould (CW, December 21, 1978) respectively.

Discussion on both deals are suspended while Modcomp completes a reaudit of its turnover and profit figures for the years 1973 to 1979. This information has been requested by the US Securities and Exchange Commission which was not satisfied with the figures submitted by Modcomp before a planned new share offering which has since been cancelled.

A Modcomp spokesman told Computer Weekly that the main change in the figures was likely to be a reallocation of certain business from 1976, when the company made a substantial loss, to 1975 and 1977.

Ken Harple left Systems Engineering Laboratories to form Modcomp in 1970.

Primate 'fascinated' by new technology

DURING a visit to the headquarters of the Kent Messenger in Maidstone, the Archbishop of Canterbury saw the newspaper group's computerised typesetting system in operation. The Harris Composition System was installed last July, and has since been extended to handle the classified advertising of all the papers in the group. Dr Coggan, who said he was "fascinated by the modern technology being used at Messenger House", was particularly interested in the eight CompuEdit VDUs which are used for text editing and input. Here operator Kevin Dodd shows the Archbishop the keyboard.

Neddy 'unhappy' with overseas trade statistics

LACK of detail and apparent gross inaccuracies in Customs overseas trade statistics, emphasised by the 1978 export figures published for analogue and hybrid computers (CW, February 8), is the subject of talks between Customs authorities and Neddy, the National Economic Development Organisation.

The Neddy working parties have an urgent need for better information on overseas trade, in particular the computer industry sector working party whose secretary, Reg Watts, told Computer Weekly that he was extremely unhappy with the quality of the Customs statistics.

Watts pointed out, "We have a drastically worsening balance of payments situation with peripherals, for example, and yet the Customs figures for 1978 gave no breakdown of the £250 million peripherals import figure."

Watts expressed the extreme concern of the computer SWP at a seminar on the subject last July that was organised by Neddy and attended by Customs officials and representatives of most of the other sector working parties.

Watts commented, "The Customs agreed that their statistics should be more specific and made optimistic noises. I hope we will get some improvement."

Efforts to achieve improvements at the moment take the form of a pilot investigation by Customs into the accuracy of statistical returns from agents that export or import electric motors which, like computer equipment, are broken down into several categories.

A report is due at the end of March which could lead to investigations into the accuracy of other returns.

Meanwhile, the Department of Industry, which includes the Customs overseas trade figures in its quarterly Business Monitor reports, which cover most areas of trade, has asked Customs to identify precisely what sort of equipment has been listed by export agents to give the apparently phenomenal rise in exports of analogue and hybrid computers from less than £13 million in 1977 to £77 million in 1978.

So far Customs have provided no answers, and a DoI spokesman was unable to say when any information would be available.

Visa plans worldwide credit card standard

A MAJOR move towards a worldwide Electronic Funds Transfer System is being made by Visa International, which has announced its intention to introduce a standard format for magnetically encoding credit cards before the end of the year. This will enable a Visa card anywhere in the world to be accepted by a terminal bearing the Visa mark.

Visa has 11,000 members worldwide, of which about 10,500 are US banks, including the world's biggest bank, the Bank of America. About 75% of the US members already issue cards with magnetically encoded information, mainly for automatic credit card authorisation, but the encoding methods vary.

The main UK member of Visa, Barclaycard, does not issue magnetically encoded cards at the moment but says that it is having cards with magnetic stripes manufactured now. In this country is seems likely that the main use initially will be with automatic cash dispensing terminals for obtaining cash advances.

Barclaycard credit authorisation within the UK at the moment takes the form of a phone call to the Barclaycard centre at Northampton, where the IB system is interrogated.

DP puts up costs—US survey

LOCAL government managers and chief executives in the US are unhappy with the results of computerisation of their operations, according to a survey carried out by the Urban Information Systems Research Group, part of the Public Policy Research Organisation.

According to the study, in many US cities the transition from manual to automatic procedures has increased operating costs, made the government less responsive to people's needs, and disrupted political relationships.

City officials are apparently disappointed with the benefits DP has provided compared with what was expected at the start. They feel the information it provides is complete and only partly helpful, for instance showing how much money is spent, but not whether it was well spent.

For planning purposes, facts and figures from DP systems tend to give just a small number of variables, when much broader-based data is needed.

Staff savings that computers were meant to bring about have also not materialised, according to the survey.

The URBIS researchers suggest that too much faith has been placed in the ability of technology to solve any problem — the "moon shot" syndrome as they call it.

Siemens' answer to the 4331

THE answer from Siemens of Germany to IBM's System 38 and 4331 is a new bottom model in the 7.000 series which slots in below the 7.708 and 7.718 announced last year. Called the 7.706, the new machine comes with a minimum 384K bytes of main memory and a minimum configuration including integrated console, floppy drive, 300 lpm printer, two 60 Megabyte disc drives and the BS2000 operating system costs Dm 265,000, about £70,000.

It is field-upgradable through the 7.708 to the 7.718, and will be available in one year's time.

Extensions are also on the way for the BS2000 operating system, which will facilitate online software development.

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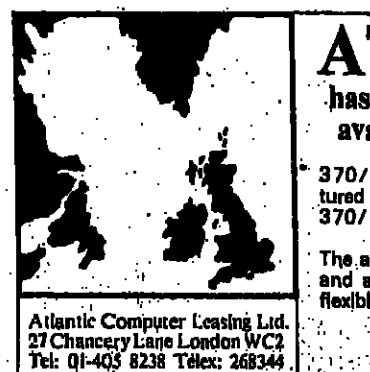

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Software links with Japan?

A SOFTWARE delegation from the "Big Five" Japanese computer manufacturers will pay a return visit to the UK in April to study possibilities and prospects for collaboration. The visit is taking place as a result of the Computing Services Association trip to Japan last year.

The Japanese have got the CSA message that UK applications software is the best in the world, director-general ... Benjamin told Computer Weekly.

In particular they are interested in the possibility of companies writing applications software for Japanese machines sold in Europe.

"The agreement under which Siemens will market Fujitsu machines in Europe has been signed when we were in Japan," said Benjamin, "something that we shall be discussing."

Apart from the operating system, ... Japanese are writing themselves, system software ... on the agenda.

The major Japanese manufacturers are Fujitsu, Hitachi, Nippon Electric, Mitsubishi and Oki. Toshiba effectively pulled out of the mainframe business last year.

Inmos talent hunt

"SOME of you have been preparing all your lives for a job like this." So runs the punch line of a recruitment advertisement placed by Inmos, the ... micro venture, in the US ... Electronic News. Inmos is looking for "people of exceptional talent" to fill posts at its ... headquarters at Colorado Springs, where there will be an atmosphere which can ... enterpreneurial instinct."

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Briefing

CDC closes Series 1 div.

INDICATING that OEM sales of Series 1 minicomputers by IBM have not been as high as originally anticipated Control Data has closed down the separate division that it set up in Minneapolis last year to market its Certainty family of peripherals and terminals designed specifically for use with Series 1 machines (CW, June 22, 1978). Certainty sales will now be handled by CDC's existing marketing operation.

Phillip Arneson, vice-president of the former division, has been named president of Computer Peripherals Inc, the joint venture owned 60% by CDC and 20% each by NCR and ICL.

Second source

SIEMENS is to second source officially the Intel 8086 16 bit microprocessor. Formal agreement is expected shortly and part of the deal calls for Siemens to design some special peripheral and interface circuits ...

Suspended

SETTING a short-cut into the office equipment market, CII Honeywell Bull of France has been talking to AEG-Telefunken about possible collaboration with the German company's Olympia office computer and equipment subsidiary. The talks have been suspended at least temporarily following CII-HB's agreement with CPT of Minneapolis under which the French company will market CPT word processors in Europe (CW, February 15).

Takeover talks

FOLLOWING the successful bid for Comten by NCR (see page 3) another communications processor manufacturer, Computer Communications Inc of Palmdale, California, is holding talks with unnamed suitors. Once controlled by Memorex, CCI builds the CC70 processor, CC30 and CC40 teletype-compatible VDUs. Amdahl, an unsuccessful bidder for Comten, is named by Wall Street sources as a likely candidate to acquire CCI.

Quicker printing

THE world's fastest laser printers are on the way from Documation, the Florida peripherals manufacturer which also builds the world's fastest impact printers. "A 33% increase to 4,000 lines per minute is about the limit for the present impact printing technology," founder and president Ray Halbert told Computer Weekly. "Our laser printers will be faster than the current 21,000 lpm products: there is no point in being slower."

Documation sites plant in Ireland — page 22.

Overseas offices

OFFICES in Melbourne, Sydney, and Paris have been established by Telecomputing to sell and support its ICL-compatible TP monitor TPS.

3,000 more DP jobs for Ireland

SEVEN more computer companies are planning to follow Amdahl, Digital Equipment, Data 100, Computer Automation, Dataproducts, Documation, and Centronics into Eire to take advantage of its government's policy of making all profits from goods exported free of tax until 1990.

"We have already created 25,000 jobs in the computer sector," Industrial Development Authority managing director Michael Killeen said last week, "and the seven new companies will create another 3,000 jobs."

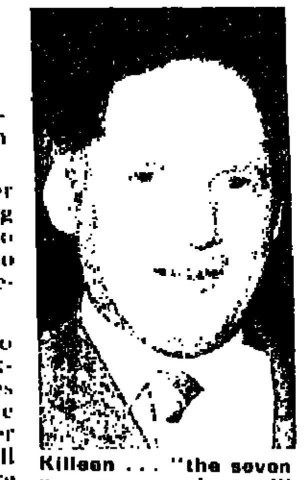
The IDA estimates that every two new manufacturing jobs create three new jobs in service industries, and believes that its investment in capital grants and in tax incentives, produce a rapid payback in savings on social security payments, and in personal income tax and VAT paid by new members of the workforce.

The IDA also gives up to 50% of the personnel costs and up to 35% of the capital costs of setting up research and development facilities in Eire.

Computers are the IDA's biggest success story, with a 100% annual growth rate in the sector, and exports of computer and related equipment up from £10 million in 1970 to £320 million in 1977, the last year for which figures are available. As a comparison, the Department of Industry estimates that UK exports of computer equipment in 1978 were about £600 million.

Digital Equipment, Computer Automation, Documation, Analog Devices and Centronics all plan to take advantage of IDA grants to do research and development in Ireland.

● The EEC has taken exception to Eire's policy of exempting all export business from company taxes until 1990. The scheme is therefore to be terminated in 1981, and after that, company taxation for all companies manufacturing in Eire will be cut to a maximum of 10% until the year 2000.



Killeen . . . "the seven new companies will create another 3,000 jobs."

TEXT STANDARDISATION GETS UNDER WAY

Govt sets up a protocols unit

TO co-ordinate the activities of organisations in the UK developing high level communications protocols, the Department of Industry has set up a Data Communications Protocols Support Unit. It is funded by the Computers, Systems and Electronics Requirements Board, CSERB, which will also pay for the unit to be represented at overseas meetings of international standards forming bodies.

The establishment of the unit should help to solve some of the problems listed in the report of the National Committee on Computer Networks last year. The report criticised the lack of "sustained official endeavours" in work towards the development of standards.

The Protocols Unit is based at the National Physical Laboratory at Teddington, Middlesex, and its steering committee includes representatives from the Science Research Council, the Department of Education and Science's Computer Board, the Department of Industry, the Post Office and the British Standards Institute's DPS/20 committee which is working with the International Standards Organisation on a standard protocol for high level "open system interconnection" (CW, April 13, 1978).

The unit is specifically concerned with protocols above the physical, link and network control levels covered by the CCITT's X25 protocol. At higher levels, protocols are very much user dependent and one aim of the unit is ensure that high level protocols are being developed to satisfy all types of user requirement.

Meanwhile, a major stumbling block to the development of communicating office systems, the lack of standards for text transmission, is at last being tackled as two committees start to work on the problem.

At a meeting in Frankfurt of an ISO sub-committee that hitherto has dealt with typewriters, the issue of text transmission standards was raised for the first time.

The other group is sub-committee DPS/OMS/2 of the British Standards Institute in the area of office machines, with the title "Text Communications and Facsimile". This started

● Turn to page 11

Probe into computer schools' refunds for immigrants

THE continuing problem of immigrants' dealings with computer schools has prompted the UK Immigrants Advisory Service to start an investigation, compiling dossiers of cases, which may lead to a complaint to the Office of Fair Trading.

The main difficulty is of overseas students who pay fees in advance, are refused admission by immigration officials, and then cannot obtain a refund.

Most of the schools state clearly on their application forms that fees cannot be refunded.

Stan Rothwell of the National Computing Centre, says that many schools will assist students in appealing against the refusal to allow them to enter the country, and if the appeal fails, will normally refund the fees despite the initial condition. There are, however, cases where they refuse a refund, and most of these the NCC considers reasonable.

The UKIAS, on the other hand, feels that people may be losing their money unjustly. The Office of Fair Trading agrees that the "no refund" clauses may be contrary to the Unfair Contract Terms Act, in which case they would not be enforceable in court.

But there is a difficulty in that

● Turn to page 13

Civil Service strike still on

NOT even an assurance from the government that it will make a staged pay offer based on the results of the survey by the independent Pay Research Unit (CW, February 15) looks likely to stop the strike planned by the two largest Civil Service unions from tomorrow (Friday).

The government offer was made last week at a meeting of all Civil Service unions called by Lord Peart, the Lord Privy Seal, but a spokesman for the Society of Civil and Public Servants Association said, "We told Lord Peart that the offer was far too vague to be helpful."

Total launch

CINCOM Systems has launched an IBM System/34 version of Total in Europe, following the announcement of the software in the US. The software was adapted from the System/3 Total DBMS design and, as expected, is a multi-tasking implementation.

CCA hits out at tax mess

DELAYS and aborted projects that have characterised attempts of the Inland Revenue to computerise its assessment and collection of taxes, was caused to a large extent by a lack of overall project management in the early 1970s, according to the Central Computer Agency.

The CCA's opinion is included in the report from the Comptroller and Auditor-General, Sir Douglas Henley, on the Appropriation Accounts for 1977/78 which discusses the Inland Revenue problems in detail.

The report covers ground that includes the scrapping in 1971 of the Revenue's original ambitious plans to set up nine large regional centres for tax assessment and its replacement with a more modest project involving three centres at Cumbernauld in Scotland, Shipley in Yorkshire, and Bootle, Merseyside, to collect but not assess PAYE and to assess and collect Schedule D and Corporation Tax. Schedule D processing was dropped in 1977 along with the Bootle centre which had been disastrously delayed by building problems.

The report reveals that systems had to be completely redesigned and software rewritten after the Revenue decided in April 1974 to instal ICL 2900s instead of 1900s.

A 2970 system is installed at Cumbernauld and the PAYE collection system went live in April last year, but the Schedule D collection part has been deferred until August 1981 so that about 1,000 of the planned 2,000 staff saving will be delayed for 12 months.

COMPUTER WEEKLY'S INSIDE NEWS

INTEGRATED NETWORK
The Post Office's planned integrated network using its packet Switched Service and System X, is due to start operations next year but it will be the late Eighties before System X will be working at full capacity. Plans have been produced to ensure the smooth introduction and development of the service. Page 13

CHESS CHALLENGE
For our chess-playing readers Donald Michie has set a challenge that will pass away many a night shift. Pages 16-17

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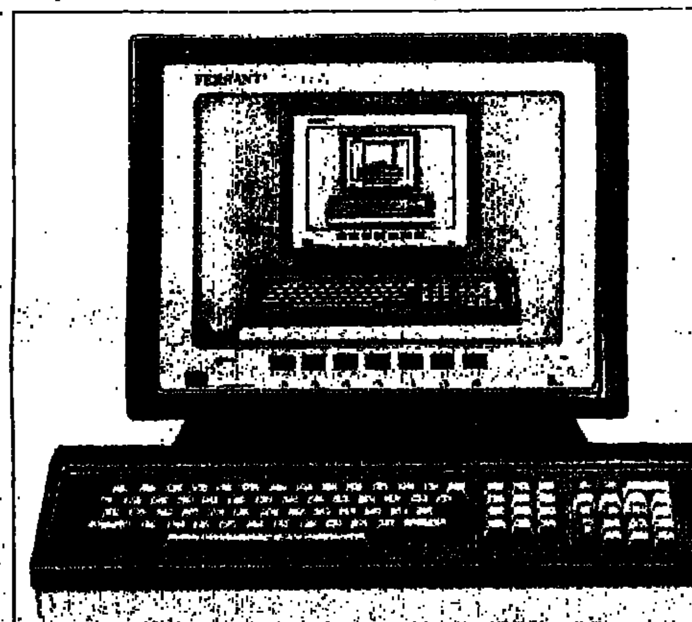

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COMPUTERY

The cost of ownership

"COST of ownership" is a concept well-known to most computer users, but less evident is a general awareness of the degree to which this concept is likely to dominate the economics of computing in years to come.

At its simplest, "cost of ownership" may be regarded as the cost of keeping a system or an item of equipment operational, once the capital outlay incurred in acquiring it has been accounted for.

What we are now faced with is a situation in which the balance between capital expenditure and operating costs has moved decisively towards the latter. And this is affecting the thinking of all who sell computers — from mainframes to micros.

The reason for this shift of emphasis is the familiar one — the declining cost of electronics as a proportion of the total cost of computer systems, together with the increasing cost of labour-intensive activities such as software development and support and equipment maintenance.

The impact of technology in the shape of large-scale integration and automated production techniques has had the effect of decreasing the cost of manufacturing hardware. Hence the capital expenditure required to purchase a specific level of computing power has decreased dramatically over the last few years.

At the same time the cost of developing operating systems and systems software and of maintaining suites of application programs has increased, as has the cost of providing engineering support, particularly on the user's own site.

As a generalisation it is thus true to say that in the computer field, technology-related costs have most impact on capital expenditure and are decreasing while labour-related costs have most impact on operating expenses, and are increasing.

There is nothing inherently new about this rule of thumb. It was an underlying factor in IBM's decision to unbundle its software products ten years ago.

But what is new is the degree to which these economic realities are being brought home to the computer user in terms of "cost of ownership."

The new IBM 4300 series computers offer greatly improved price/performance over the mainframes which they replace for example, but the cost of ownership associated with the new computers could well increase substantially.

Operating systems, for instance, while still available free of charge, are now also being offered in a packaged form as Installation Productivity Options, IPO/Es, together with a range of program products which may be selected by the user to suit his own needs. And the user will pay for the IPO/E he has selected at prices ranging from £640 to £1,700 a month.

It is claimed that software support will cost the user no more than it formerly did. And this is true where software problems can be solved by a telephone call, but problems entailing a visit by an IBM systems engineer will mean additional charges for the user.

On the hardware side it is expected that the reliability of the 4300 processors will be such that no routine processor maintenance will be required — a case where technology is having a beneficial effect on operating costs — but it is safe to assume that, when a visit by a field engineer is required, it will cost more than it formerly did.

IBM, of course, is not alone in identifying and reacting to labour-related costs, nor has it been affected as strongly as some by this phenomenon. In the field of micro-based systems and peripherals, for example, where hardware costs are even lower, the cost of providing on-site field engineering support may bear little relationship to the capital costs of the equipment.

The lower the unit cost of the equipment the more uneconomic it is to service it in the field. Little wonder then that Centronics, the printer manufacturer, is experimenting in the US, with walk-in service centres, to which users of low-cost printers — particularly those being used with personal computers — can bring their equipment if it requires attention by a service engineer.

And Texas Instruments is planning to establish "technology centres" which will act not only as retail outlets but as sources of advice and support for customers buying micro-based products — the majority of which are not even on the market yet.

In this, as in other respects, the semiconductor manufacturers may be providing a lead which the computer industry will follow. One thing is certain, until the era of "throw-away" electronics is literally with us, methods of controlling — and manipulating — the cost of ownership will be an important consideration for suppliers and users of computer equipment.

Ten years ago...

COMPUTER WEEKLY FEBRUARY 20, 1969

A SEVENTH unit providing services to industry and supported by MinTech was opened at Salford University . . . Bertrand Russell filed a lawsuit against Honeywell, which had included the date of his death ("1967") in an ad . . . A 50 Top Pops chart was to be produced by computer by the British Market Research Bureau . . . Use of computers had added $134 million to Federal tax collected in the US in 1968, and had itself cost $143 million . . . "Gross waste of the use of (government) computers" was an MP's comment in the Commons on learning that they only worked a 50-hour week.

1984 and all that . . . .

THIS week's examples of the funny things people say in the media about computers were sent in by A. J. Stedall of The Wirral, and John Foote of the National Engineering Laboratory, who each win £5.

The factory, which will produce microprocessors and semiconductor memories of 16K (silicon chips with up to 16,000 different uses), was welcomed by Sir Kenneth Thompson, chairman of Merseyside County Council.

Wirral Globe

There are other [microprocessor-controlled] games, considerably more complicated, such as the electrical chess board which can be programmed to beat you no matter how good a player you are.

Sunday Post, Glasgow

FOCUS

The 100% club—or bust

FOR most DP managers, joining the club suggests applying to the IDPM or BCS. But for the salesman, the choice is rather more limited — it is the 100% club, or bust.

While the DPM survives by a configuration of craft, cunning and finger-crossing, the salesman has to adopt a more positive approach, governed by incentives, targets and achievements.

For the installation, a missed job run target is unfortunate but not necessarily critical involving, at worst, late shift-working or contacting the local bureau. A pat on the back from senior management works wonders in such circumstances. For the keen salesman, however, failure means fewer pats on the back, more boots on the rump.

Give a salesman an incentive, and in all probability he will try selling it. Incentives for the installation meanwhile are few and far between, unless you happen to be the site engineer. In this case, incentives are lavish and include fully-fitted, comfortable accommodation situated adjacent to the coffee machine and car park.

Duties come very much request-shaped. "If you have the time, perhaps you could take a quick look at the tape drive — it seems to be getting rather warm."

The programming and systems team seldom responds to incentives, threats or pleas. Any attempt to impose timescales is doomed to failure, as are suggestions that certain system short-cuts are introduced into the proceedings.

Not quite so rigid in their procedures are the operations team. Give them a new application to run and unforeseen corners are cut and S-bends utilised. Dangling the prospect of an advanced level course, a visit to the next central London exhibition or a trip to a remote installation works wonders for morale.

When it comes to the DPM, incentives are few and far between. Only the DPM himself can earn that reputation which will pay salary dividends in terms of a new job. The offer of the visit to the next IBM User Group outing hardly turns him on. Neither does a company car if the end result is a series of midnight panic calls to the installation.

In any case, the DPM has a sneaking suspicion that the greater the workload achieved the more there will be in the pipeline.

For DP management, the 100% club is all too realistic.

Wilkes

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Privacy questionnaire goes out to 4,000

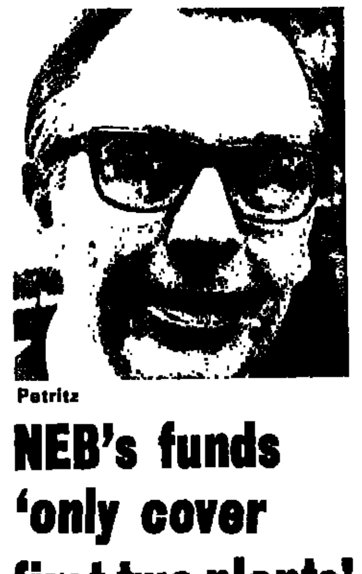
THE questionnaire on privacy produced jointly by the Institute of Data Processing Management and Computer Weekly (CW, January 4) is now complete and has been sent out to the Institute's 4,000 members.

Non-members are also welcome to express their views, and particularly on the Data Protection Committee's proposals. To do so they should contact the IDPM at 51 Goschen Buildings, 12/13 Henrietta St, London WC2E 8NU, tel 01-240 3304, and ask to be sent the questionnaire.

The Home Office is now considering the DPC's report, and has said that it will also take into account the results of the IDPM survey. Direct submissions from organisations or private individuals are also welcome.

In an appraisal of the DPC proposals, the Institute's secretary-general, Ted Cluff, mentions the popular view of those responsible for computers as "forces ranged against the advancement of the freedom of society," and says, "Those of us in the industry know this is nonsense." However, he feels that legislation will probably come and is pleased at the form proposed in the report.

Fundamentally, responsibility for privacy has been placed on the user of information and not on the computer manager or DP department and this is how Cluff feels it should be.



Petritz

NEB's funds 'only cover first two plants'

MORE details have been given of the four semiconductor manufacturing plants to be established in the UK by Inmos, the company set up by the National Enterprise Board. Talking in Philadelphia last week, managing director Richard Petritz said that all four would have diffusion capability though the division of production would be on a technology rather than a product basis.

He indicated that the NEB's funds covered the establishment of only the first two plants, sites for which have yet to be announced. The two other plants would be paid for from funds generated by Inmos.

"This means we would have to be a $140 million to $200 million company to do it", said Petritz.

The first plant will run a manufacturing process equivalent to the current state of the art, such as Intel's HMOS process. Devices made will utilise the three micron geometry and standard lithographic production techniques. The second plant will be aimed at devices using two micron geometry, while subsequent facilities would push towards one micron.

Market spectre for semicon makers

THE memory market could be the mainstay of future business for semiconductor manufacturers as more systems houses start up their own semiconductor operations. This was the spectre raised by Dr Gordon Moore, chairman of Intel, when he gave the keynote address to the International Solid State Circuits Conference in Philadelphia last week.

Between 1975 and 1979 the number of systems houses with internal semiconductor production facilities had doubled, while the number of general semiconductor makers had dropped by 10% in the same period, said Moore.

The prime reason he cited for this trend was the ever-increasing complexity available in semiconductor technology. Except for memory devices, he said, the semiconductor industry was even now not process or technology limited. Instead it was limited by the scope of available product definition and application.

At a time when the technology allowed the design of increasingly complex circuits on to a single chip, it was possible to suppose that the semiconductor business offered tremendous potential, but Moore indicated that this would not necessarily be the case.

The cost of design was doubling every two years and design times for new products were now at about the same mark. Defining new products was increasingly difficult, said Moore, for it required matching the best capability of the technology with the largest number of applications and market areas. Only in this way could a viable product be made.

"Most devices currently made are nowhere near the complexity limit, mainly because products that do reach it cannot be defined, except for memories," Moore said.

He saw three main volume markets for the semiconductor manufacturers. The standard TTL families of today; the LSI system functions area, such as interfaces and peripheral controllers; and, lastly, memories.

Many other applications would be met by systems manufacturers producing their own parts for their own requirements. As Moore put it: "We may look back and say: thanks for the memories."

Uniscope emulator for Ranger 3200

SOFTWARE enabling Diablo's Ranger 3200 to emulate a Uniscope 100 clustered terminal has been developed by a joint team from Leasco Software and the Ranger's UK distributor, Business Computer Systems Ltd.

Govt amendment to Freud Bill defeated

A GOVERNMENT amendment which would neutralise the disclosure provisions of Clement Freud's Freedom of Information Bill (CW, February 8 and January 18) was defeated in committee last week. In theory, the government should, as a result, not be allowed to reintroduce the amendment when the Bill goes back to the Commons, but the Speaker has a discretion to overrule this and this discretion is normally exercised in favour of the government.

The amendment would have removed the duty of the Civil Service to disclose any official documents to members of the public who wish to see them, and replace this with a requirement on the Civil Servants simply to "consider" disclosure. This would wipe out the whole point of the Bill, as they consider disclosure now (and usually refuse).

The government will probably try to raise the amendment again at Report Stage.

The whole Bill should finish its committee stage today (Thursday) and go back to the full House for report on April 6.

Supporters are not optimistic, owing to the probability of wrecking amendments being brought back; also, the Tory front bench appears to be quietly whipping up opposition to the Bill.

A second amendment which would remove the power of the courts to review security classifications of documents was withdrawn after opposition not only from Freud's supporters but from the official Tory representative as well.

Part 2 of the Bill, which is less controversial and an improved substitute for the old Official Secrets Act Part 2, providing penalties for revealing secret information, has finished its committee stage without major change.

Computer crime

BIBLIOGRAPHIES on computer crime and computer privacy have been produced by the Institution of Electrical Engineers library. The crime bibliography costs £4.25 and the privacy one, with 250 references, costs £8. Orders to the IEE at Savoy Place, London WC2R 0BL.

Comten offer oversubscribed

THE cash offer of $26 a share from NCR for up to 45% of Comten Inc of St Paul, Minnesota, has been substantially oversubscribed, and holders will get cash for only a proportion of the shares tendered. NCR plans to exchange the remaining 55% of Comten shares outstanding for $26 worth of NCR stock.

Comten is attractive to NCR because some 5,000 IBM terminals are attached to Comten processors.

"NCR believes it can replace a substantial number of those with its own terminals," said Harry Edelson, analyst with New York stockbrokers Drexel Burnham Lambert. "In the longer term, they could also replace some of IBM computers attached to the processors with their own mainframes."

Advanced TTL from Texas

TWO series of Schottky transistor-transistor logic, TTL, circuits have been introduced by Texas Instruments. Called Advanced Schottky, their technology represents a third generation in Schottky TTL Circuitry, according to TI. They are twice as fast as the existing generation of TI Schottky circuits.

The SN74AS series of circuits is aimed at mainframe and military applications and features a 1.5 nanosecond gate delay and a gate power dissipation of 22 milliwatts. The SN74ALS series of low power circuits are intended for use in minicomputers, and terminals have a typical dissipation of only one milliwatt. The gate delay is four nanoseconds.

GOVERNMENT COMPUTING

NATIONAL GAS TURBINE ESTABLISHMENT
PYESTOCK, FARNBOROUGH, HANTS.

A digital computer is required by the above organisation. It will be dedicated to the task of predicting the life of gas turbine components by performing a number of three dimensional non linear finite element analyses to determine the stress they experience in an operating engine. It is estimated that during an analysis 16 million double precision floating point numbers will be active and that a complete run will require up to seven days of continuous computing.

Applications for copies of the Operational Requirement quoting CEH/29 should be made to

Central Computer Agency, Room 822
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Proposals must be received by 30th March, 1979.

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Data General

Dastardly plot uncovered....

PANIC and confusion gripped the North West last week after the shock revelation that a firm in Wigan has compiled a secret computer file of the favourite colours of everyone in the town.

It was crusading journalist Duncan Candle, fresh from his battles with Military Unintelligence, who uncovered the dastardly plot. As might be expected from the general naivete of the public, townspeople were slow to appreciate the seriousness of the threat to their lives and liberties posed by this monstrous invasion of privacy, but Candle spent several days galloping round the streets on horseback calling out, "Big Brother! 1984!" and soon convinced everyone of the lunacy in our midst.

Expressing her horror at the disclosures, Patricia Suet, general secretary of the National Council for Diabolical Liberties said, "If this information got into the hands of a mail order firm they could send out advertising shots exactly tailored to people's preference for colours." Asked what would be the result she replied, "Large profits for the firm."

"More serious still," she said, "is the danger that the police could get hold of this information. Then, if someone is seen in suspicious circumstances wearing, say, a blue anorak, the police could haul in for questioning everyone in the town whose favourite colour is blue.

"On the same subject," Ms Suet continued, "we've just heard that records are being compiled in Heaven of the most intimate details of individuals' lives, and these books could seriously affect people's chances for salvation.

"We are demanding that a Data Protection Authority be set up immediately, and that one of its first actions must be to send inspectors to Heaven to check up on these records.

"We're a bit worred about our chances of getting this through Parliament, though," added Ms Suet. "So many politicians have sold their souls to the Devil that they may not be interested."

Downtime by Chad

● I HEAR that the Open University has been asked by the government to develop training packages for microprocessor appreciation. I hope the OU people will brush up on their chemistry before they start: according to the latest issue of their paper "Sesame", micros are "tiny computer circuits in the form of slivers of silicone".

Producing programmers in sufficient quantities to meet the ever-increasing demand, is the prime objective of the National Computing Centre's DP Threshold Scheme; and the number of students will be almost doubled, from the present 540 to about 1,000 in the next Threshold year, which starts in June. Here NICHOLAS ENTICKNAP looks at the training scheme at Bournville College of Education in Birmingham, which has completed three courses catering for 40 students, and is currently running a fourth.

Pictured right, Don Lynch, director of computer studies at the Bournville College, looks on as a group of NCC students work out a problem on one of the Research Machines' 380Zs.

On the Threshold of a DP career

AFTER a year and a half of operation, the NCC's DP Threshold Scheme has established itself as a *valuable source of junior staff for computer installations.* Of the 546 young people who have completed the course, on average more than two out of every three have found DP jobs, many of them before their course had finished.

The DP Threshold Scheme is run by the National Computing Centre, funded by the Manpower Services Commission. It was initially set up as one of a number of measures by the present government to reduce unemployment, particularly among school-leavers.

With growing government awareness of the importance of computers this has now become a secondary objective. The main aim now is to ensure that programmers are produced in sufficient quantities to meet the ever-increasing demand.

A working party of the Manpower Services Commission is currently studying the success of the scheme with a view to deciding whether any alterations to the way it is run are necessary.

The NCC director of the scheme, George Penney, expects that the number of students taking the course will be increased from its present level of 540 to about 1,000 in the next "Threshold year", which starts in June.

A total of 53 courses have been run or are in progress. One of the centres that has been involved is Bournville College of Education in Birmingham. The college has now completed three courses, catering for 40 students in all, and is currently running a fourth.

Director of computer studies Don Lynch told Computer Weekly that over 80 per cent of the students who have completed their studies are now working in DP installations. Of these, over a half were offered jobs by the installations in which they worked as part of their course. The others won their jobs in open competition. There is one instance of a student gaining preference over 200 other applicants, many of whom had programming experience, or better academic qualifications, or both.

Each course tended to lose two or three students. The reason, according to Lynch, was not so much lack of aptitude or ability as of commitment. There are strict regulations covering attendance, and students who continuously absent themselves without leave are dealt with firmly.

More than 50 companies have participated in the scheme with Bournville College. This involves acceptance of a student as a junior trainee, working either as an operator or a programmer, for either nine or 15 weeks. The company is under no obligation to offer a job to the student when the training period has ended.

Trainees are required to conform in every respect ... usual conditions of service ... computer department, ... the working of shifts, ... ality, attendance, the ... out of orders and instruc... supervisory staff and ...

Installations do ... pay salaries to the ... commit themselves ... financial outlay. A gr... week is paid to each ... the NCC. National ... records are also credi... NCC. If the host org... takes out any insuranc... to cover risks involv... placement of the trai... premiums will be reimbu...

The big advantage ... scheme to the compu... that it gives him an opp... to size up the merits of ... junior staff to a much ... extent than is possible ... interview or an aptitud... without committing hi... any way.

The response typifyi... view came from Derek A... operations supervisor at ... bury Schweppes, who ... Computer Weekly, "... taken on four students ... course, and ended up emp... three of them. The advan... that they have a good ... in the theory of DP. We ... have to do is to teach ... about our particular ...

Those who are looking ... scheme for the provision ... trained junior staff ... ever, likely to be ... One DP manager, ... that his name be withh... "I was very disappoint... course is far too ... covering an enormous ... spectrum of knowled... extremely superficial ...

"We took on two peo... were effectively ... novices, and have ... close supervision. They ... think like programmers ... and had to be led by the ... the way. Only now, ... four months, ... their own with any ...

"It's ... their fault ... don't regret taking ... their experience was ... pointing. The course ... like as useful as ... on programming, ... more rigorous and ... trated."

In general, ... scheme does seem ... ducing students ... background knowled... puters, which ... employers want ... Bournville College ... pronounced ... satisfied with the ... scheme to date ... for expansion ... look good.

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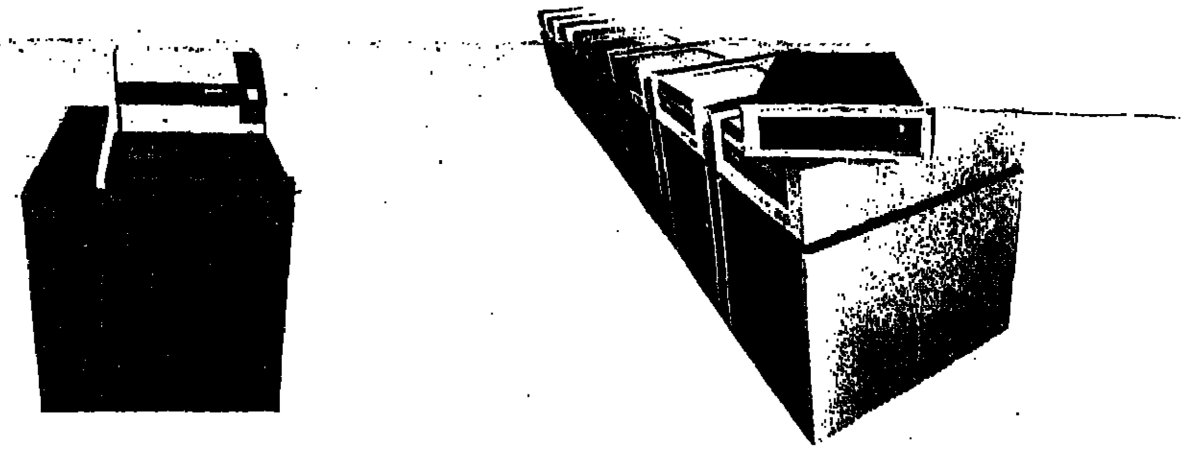

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ICL to provide 1980 Olympics results

A CONTRACT worth £930,000 for a text-editing and store-and-forward message switching system for disseminating results from the 1980 Moscow Olympics has been won by ICL.

Under the contract, ICL is to supply two 2904s, each with 96K words of store, four 60 Megabyte disc drives, tape drives, card and paper tape readers and printers. The peripherals will be switchable between the two processors, with the second providing stand-by cover.

The results will be compiled on an unidentified IBM computer and transmitted to the ICL system for editing and for onward transmission to five Press agencies — Tass, UPI, AP, AFP and Reuters.

As well as the hardware, the contract price covers systems design, implementation assistance, and support during the Games.

ICL was one of a number of companies asked to submit proposals for the system. CII-HB is the European leader in compilation and distribution of sports results, a field in which ICL has little experience.

Unlike the Montreal Olympics, held in an unfinished stadium, the Moscow Olympics are the subject of exhaustive preparation. A full dress rehearsal for both the stadium and the ICL computer system will take place in July with the Spartakiada Eastern European Games.

● With its original proposal for a £3.5 million 1100-based message switching and editing system for Tass vetoed by President Carter, Univac is preparing a scaled down configuration for approval (CW, February 15).

Personal exchange

PERSONAL computer users have been invited to join the Central Program Exchange scheme administered by Wolverhampton Polytechnic (Software File, June 22, 1978).

Membership will cost £10 a year, providing a selection of up to 10 programs. Further programs can be bought at a fixed cost of £2 each. Those who donate an acceptable program to the library will be able to select *three extra programs free of* charge.

£60,000 order

FOR use in the design of blast furnaces and other related equipment, Davy International's Iron and Steel division has installed six Harris 8210 terminals, and a Harris remote job entry system to handle the more commercial applications including *payroll and job control.* Value of the order is put at £60,000.

ENTRY FORM

We have read and accept the conditions of entry for the Computastars 79 competition and would like to enter ... men's teams ... women's teams

Company

Name of unit

Number of staff in unit

Address

Name of contact for team (s)

Telephone number | Extension

This team would like to compete in the following region: NORTH EAST NORTH WEST MIDLANDS SOUTH WEST EAST ANGLIA THAMES NORTH WEST THAMES SOUTH SCOTLAND

Please circle appropriate centre

In all matters relating to the rules and the competition the decision of the organiser is final

Please send this entry form to: Computastars 117b High Street, Croydon, Surrey Tel 01 688 6690

Calling all DP athletes

ENTRIES are beginning to roll in for the heats of Computastars 79, and the contest is attracting athletes from computer departments all over the country.

Closing date for entries is March 10, so don't miss the chance to get your teams into the big competition. Complete entry form and send it to Computastars, 117b High Street, Croydon, Surrey (tel: 01-688 6690), from where conditions of entry may be obtained.

Following the success of Breadboard '78, Trident Exhibitions announce

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December 4th–8th Royal Horticultural Hall, Westminster, London SW1

Centre-file moves into Stepney

ANTICIPATING a turnover of nearly £13 million in its current financial year, the National Westminster Bank's bureau subsidiary, Centre-file, is moving into a new computer centre at Leman *Street in Stepney, London E1.* Two new systems, an IBM 3033 and a 3032, have been installed there to take over the workload of three 370/155s and two Honeywell Level 64 machines.

The Honeywell installation was acquired when Centre-file bought Management Computing Services in 1976, and Centre-file made it clear at the time that the Honeywell machines would be replaced by IBM kit

Centre-file's managing director, Ron Bennie, who took over after a management shake-up last year, has pointed out that payroll *is now one of the fastest growing* sides of Centre-file business and is used by 1,900 customers with 650,000 employees.

Other Centre-file services include major online accounting operations for two groups of clients — 27 stockbrokers in the City of London that handle something like 50% of all Stock Exchange bargains and a collection of building societies with about three million clients.

Apart from the two processors, the line-up of IBM hardware at Leman Street, all of which is purchased, includes two IBM *3800 laser printers, each running* at up to 13,360 lpm, and 24 IBM 3350 disc drives holding 7,200 Megabytes. An IBM 3850 mass storage system that can hold up to 100,000 million bytes is to be installed.

The Leman Street site is near to NatWest's own management services centre at Goodmans Fields near Aldgate.

IBM copier prints both sides of page

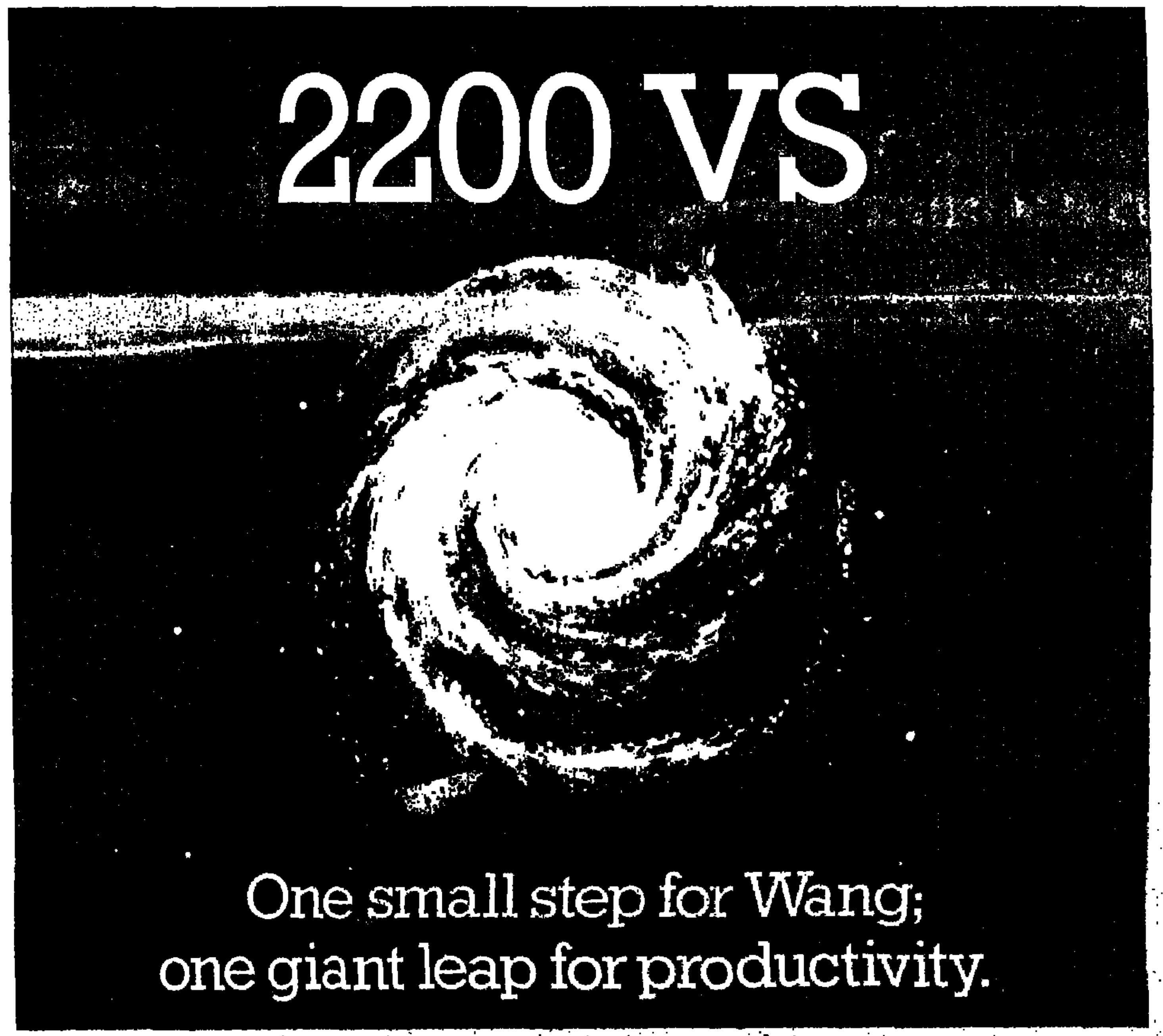
IBM has joined Wang in the "intelligent copier" stakes by announcing in the US a new addition to its Office System 6 word processor range. This is the 6670 xerographic printer which doubles as an ordinary copier. It costs $75,000, twice as much as the Wang Image Printer (CW, December 14, 1978) but gives twice the speed.

A highly original feature is that it prints on both sides of a page.

In line with the basic idea of the intelligent copier, the 6670 *acts as a printer by writing characters* on a xerographic drum and then producing a hard copy electrostatically, as do conventional copiers. A glass plate reading station and an optional scanning mechanism are provided so that the unit can also be *used as a document copier.* (This copying feature has now been dropped from the Wang machine in the US, lowering the price $3,000 to $32,000, but it may still be included when the European release takes place this summer.)

The IBM printer uses a laser to write on the drum, unlike the *Wang which has a cheaper CRT* arrangement. It prints or copies at 36 pages a minute (1,800 characters per second) and communicates at up to 4,800 bps (480 chps). There are seven different typestyles of which any four can be mixed on a page.

Each 6670 has a magnetic card reader built in from which it can take its input, but it can also communicate with an IBM System 3, 32 or 34, and most significantly, with the new 4300 mainframes. Thus it can act as an ordinary DP printer, giving high quality and speed. IBM says, however, that it is not *compatible with the 8100 or* System 38.



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MICHIE'S PRIVATEVIEW

Equipped to make a proper job of philosophy

A SHIFT of view, which to some computer people seems very curious, is bringing the study of philosophy out of the shadows. Scientists and engineers normally regard philosophy as just a particularly pretentious "no win" discipline, whose practitioners claim to be the great explainers. Yet as soon as real progress is made with some question, the topic is taken over by a different kind of professional — trained actually to find out how things work rather than to speculate about why it is all so difficult.

So questions of perception which used to be "philosophy" are now investigated by psychologists. Worries about reasoning and logical consistency have been taken over by mathematicians. Matters of linguistic usage now belong to theoretical linguists. Numerous earlier takeovers could be cited. Aristotle tried to settle by commonsense argument whether light travelled at a finite speed. We smile at his audacity, and do not feel it in the least strange that physicists rather than philosophers are now consulted about such matters.

The successful annexations by new-born sciences commonly followed advances in technical instrumentation. Are things possibly brewing up to a final takeover, when some new instrument will enable the residue of philosophical questions to be annexed in one fell swoop by a new science equipped *to make a proper job of it?* I am one of those who believe so, holding that the remaining, and deep, problems of causality, purpose, consciousness, knowledge and belief can soon be taken from people who have made very little of them and transferred into laboratories equipped for machine intelligence work.

A new book, The Computer Revolution in Philosophy*, by Aaron Sloman, takes something like the same view. Sloman, a professionally trained philosopher, may possibly expect his profession to persist under its present name while introducing the computer as its chief future means of plying its trade. But the alchemists sank from sight, and people referred to as "chemists" took their place. I think it probable that we shall drop "philosophy" and at some stage start talking about "computer epistemics," or some such term.

That is, however, by the way. The main point is the passion, background of ideas, and ready pen which Sloman brings to what posterity will see as this century's most critical upheaval. His book discusses the aims of science; models, concepts and symbolisms for interpreting our experience of the world; the nature of expla*nation, prediction, and control*; reasoning — its formal basis, analogy, intuition, the nature of mind and memory; and, running through it all, the role of experimental computing and in particular the methodology of artificial intelligence in clarifying these matters.

For generating excitement in the reader, Sloman's style of dogmatic preachment, in all its egotism and narrow condescension, can hardly be bettered. But once the imagination has been thoroughly stirred and the reader begins to want reliable technical information presented in objective and orderly fashion, then he should at once abandon his copy of the book in some public place and repair to a library for serious work. In Bob Dylan's words (almost):

"... Read at your own chosen speed;
It's not the book you wanted,
It's not the one you need!"

The difficulty is to know what other texts to recommend. In the form of entire books, as yet there are none. Boden's Artificial Intelligence and Natural Man, already reviewed in this column, is authoritative but necessarily superficial. Perhaps the best way in is via the Hayes-McCarthy paper, Some Philo*sophical Problems from the* Standpoint of Artificial Intelligence, in *Machine Intelligence 4* which duly appears in Sliman's bibliography.

A paper of mine, in *Machine Intelligence 8*, is about defining and numerically measuring the amount of knowledge contained in a (machine or human) knowledge-source. The practical importance of theoretical solutions to these academic-seeming questions is likely to manifest itself in work on large databases and in "expert systems."

A masterpiece in miniature is an introductory typescript prepared for the Sloan Foun*dation by America's most* eminent cognitive psychologist, George Miller. Although technical, it is well within the reach of the interested Computer Weekly reader.

These papers, and treatments by others both published and not yet published attempt to begin where Sloman leaves off.

*The Computer Revolution in Philosophy by Aaron Sloman, published by Harvester Press, 304 pp, £12.50.

PROGRAMMER NOTES

End-users' malady —dazzled by SF

WHEN was the last time you noted an IMTS memory failure? Or suffered (professionally) from the effects of the Star Wars Syndrome?

The answer is likely to be "quite recently" if, like most programmers, your work is directed not at meeting your own DP requirements but those of that barely-domesticated beast, the end-user.

This at least is the argument of a recent contributor to the US weekly Computerworld. For IMTS — or "I Meant to Say" — is just one of the complaints laid at the feet of the end-user by Jack Stone in what he calls An Open Letter to DP Users.

On the subject of IMTS he writes.

"This malaise only evidences itself after you have signed off on a set of system specifications and we are nearly finished with the programming phase of the development project.

"It takes the form of an overly pleasant phone call from you after you've examined preliminary output. You tell us that your inventory stock items really number 50,000 not 25,000, or that the Julian date field should be expanded to accommodate the 21st century.

"With regard to changing needs, some say that users are simply not capable of conceptualising all their systems requirements at one (early) point in time. Others claim that users change their minds solely to irritate the DP department.

"But I feel the reason users always seem to change is because they have this ingrained faith that we DP types are experts at mental telepathy ... through a combination of ... tion, magic, and mind pro... tion, we always know what ... user's needs are — with inf... precision."

Stone notes that exagger... expectations both in this ... and others may be a spin... from the glamorous pu... image of much advanced tec... nology.

"I think you users suffer fr... the insidious *malady* known ... 'Star Wars Syndrome.' You c... tinue to be dazzled by ... majesty of space-age scie... fiction and expect incredi... capabilities to be installed ... your information systems.

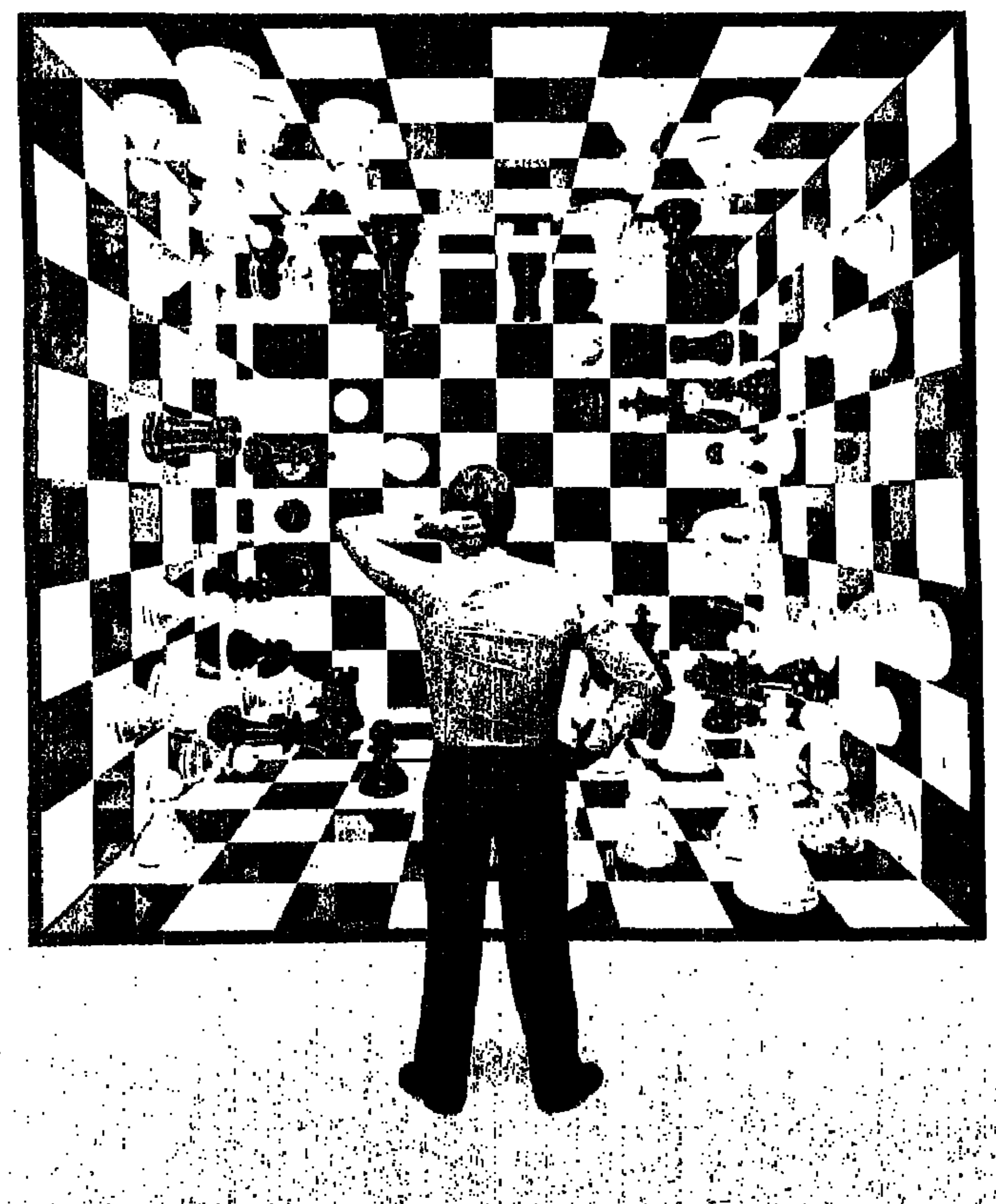
"You are enchanted with ... accuracy with which Lu... Skywalker was able to laun... his laser-guided torpedo aga... the alien forces and forget ... the accuracy of the pay cheq... is strongly dependent up... horde of data entry perso... who are being paid just a ... above the minimum wage.

"And you don't appreciate ... agonising detail involved in ... design and construction of ... system; it takes a long, long ... to put a high quality system ... the air."

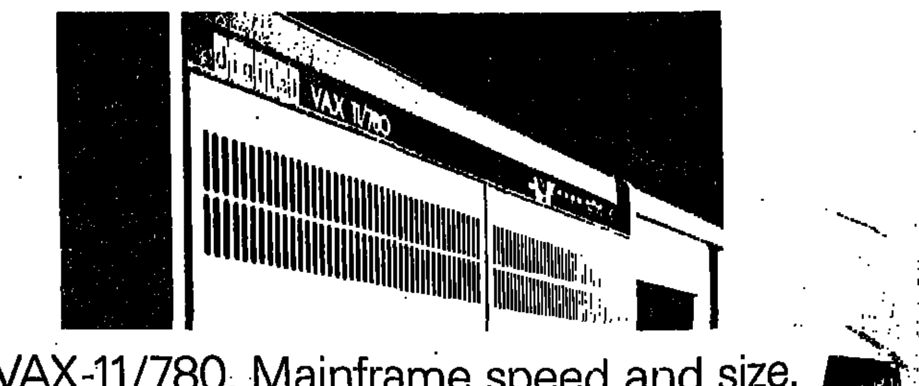
Stone concludes with ... appeal for appropriate re... tion when the system de... is what was wanted.

"We all seek that ... psychic pay-off which ... eluded nearly all of us ... that wonderful feeling ... curs at turnover time ... tell us with sincerity, "H... and gals, you did it! The ... system I need and I ac... with a heap of thanks."

The more complex your real time application...



... the simpler your answer becomes.



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SOFTWARE FILE — EDITED BY PETER HEWITT

No single PDP-11 Coral best for all applications

"THE best choice of Coral compiler for the Digital Equipment PDP-11 is influenced by many factors, some of which depend on the compiler supplier and some of which depend on the user. ... It is therefore not possible to choose a compiler which is the best for all applications."

This is one of the conclusions of a report prepared by Real Time Developments on the three Coral compilers available for the machine.

In choosing a compiler, argues the report*, what is important is a correct match between compiler (and compiler supplier) characteristics, and the needs both of the application and the user.

The main body of the report thus consists of a detailed comparison of language features, while including sections on library support, pricing, supplier support, and the history of each compiler.

The report also includes what are believed to be the first rigorous performance comparisons, based on the execution of IECCA's benchmark programs. It is in this area that some of the most dramatic differences emerge.

For example, in a test involving integer and fixed arithmetic, the HPAC compiler could not be tested at all as it does not support the FIXED number type. Meanwhile the DEC compiler ran very slowly as it implements fixed arithmetic with floating point routines.

With the proviso that the tests were run on a machine without floating point hardware, code generated by the SDL compiler here offered major performance advantages while it also ran considerably faster in a test of part word manipulation in tables.

In most other cases, though, the compilers performed similarly, with variations in run speed not exceeding about 20 per cent.

With the draft British Standard currently being circulated, the report devotes one lengthy chapter to comparisons against the existing (closely similar) standard as embodied in the Official Definition.

All the compilers here fell short of the top level of implementation, the HPAC version containing the most deviations. However, this implementation also offered the greatest number of extensions, including many very useful facilities such as double precision floating point, multiple assignments, and the ability to interface with Fortran, RTL/2, and BCPL.

It was also the only one to be fully recursive in its standard form.

Here, though, as elsewhere in the text, the authors emphasise that the relevance of features can only be judged against user requirements.

Some users keen to ensure portability by conforming to the standard could find it attractive to avoid an implementation containing additional facilities. For other users, particular extensions could be vital.

The misleading question of MOD official approval is one area usefully clarified by the report. Official approval, it notes, can only be extended to the supplier of a complete system: hardware, operating system, and *language compiler*.

It is only DEC, therefore, that is capable of being approved as a supplier, while approval cannot cover any compiler per se.

The outcome originally of a commissioned study, the report has attracted considerable industry attention and has been praised for its lack of bias in this fiercely contended field.

*PDP-11 Coral 66 Study Report, pp 138, price £900 from Real Time Developments Ltd, Caroline House, Invincible Road, Farnborough, Hants. Tel: (0252) 46213.

Forum on protection

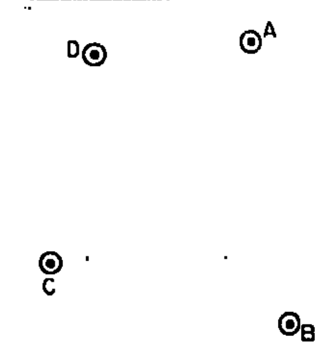
THE confused question of the legal protection of software is to be the subject of a two-day conference in Amsterdam in March.

One aspect to be examined will be the current legal position both in the US and Europe. Recent decisions in both places will be discussed.

The conference will also address the topical question of what form of protection is appropriate. Problems have been found in applying either patent law or copyright law to software, with the result that some now think that special legal provision could be the best solution. This was, for example, the position adopted by dissenters to the US commission reporting on the matter (Software File, August 3, 1978).

The conference dates are March 14 and 15 at the Hotel Krasnapolsky, Amsterdam, and it is organised by European Study Conferences (tel: 057-282 2711).

Puzzler



THIS diagram represents four counters placed centrally on various border squares of an n x n grid. But the grid itself has been omitted!

Each counter is situated on a different edge of the board, but none of the four corner squares is occupied. The problem is to determine how big the board is. See page 61 for solution.

Commercial assembler

A BUSINESS oriented assembler language has been introduced by Vega Computers for its small business system. Including resident debugging and testing facilities, it is said by the company to allow programs to be developed at four times the speed of normal micro-assembler languages, while retaining the run-time advantage of assembler.

Vega has also announced two further standard application packages, for purchase and nominal ledger, and for payroll and personnel recording. Each is priced at £750 and is supplied on floppy disc together with full manuals and on-site support.

H-P online package for manufacturing control

THE lively market for manufacturing control systems has been entered by Hewlett-Packard, with a suite of online software for the HP3000 range.

Called MFG/3000, the package offers capabilities in three areas, based on three modules available either individually or as a complete system.

The first, EDC/3000, is for engineering and data control and creates and maintains bills of material and labour.

The inventory and order status module, IOS/3000, processes material issues and receipts; maintains planned and released orders; manages planned issues; and provides current balances for all inventory items.

The final module, MRP/3000, caters for material requirements planning.

All the applications are based on online transaction menu screens, and represent an outgrowth of HP's experience with the use of the HP3000 to manage its own manufacturing operations. According to the company, the software can be implemented without the help of in-house data processing staff.

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OP SPOT

LAST week's interview with Chris Nunn, head of computer operations at Marks and Spencer's West London installation, described how he has reorganised the site in the last four years. Now here are the views of some of his staff on the set-up there.

Beneficial rule of ops department

Coffee break for (left to right) operators Christine Neville, Tim Smith and Andy Paszkowski, and trainee operator Tom Roberts.

GRAFFITI that read "Operations Rules — OK" would not be out of place on the walls of Marks and Spencer's West London installation, because that message sums up the philosophy behind its day-to-day running.

Unlike the goings-on at many other sites in the computer industry, the operations staff there control such matters as system modification, and the acceptance and implementation of new applications.

Much of the department's strength lies in its organisation and the role played by each of its sections.

Led by operations supervisor Dave Spikesley three shifts, each of ten operators, work a 12-hour rota and provide a 24-hour user service. They also work days at weekends.

First line of support for the operators is the system support group, or the fire brigade as it is known. It has a staff of seven and is headed by Penny Fenner, who has a programming background.

Harry Godfrey, a man with many years' operations experience, is in charge of the technical support group, which provides both second-line operations support and advice to programming.

The heads of the above groups report directly to operations manager Terry Mitchell.

The operators are responsible not only for running the site's ICL 1904S and 2970, but also for all job make-up and disassembly, which includes quality control, and decollating and bursting output. To that end each shift is divided into online and offline teams.

Dave Spikesley told me, "Each shift is led by a service controller, who is really shift manager. Under him are two team leaders, one for each function."

The offline operation is very important as the bulk of the workload is input in batch. But in an emergency, when the chips are down, as Dave Spikesley puts it, the offline staff will go into the computer room and help to run the systems.

Glass panels enable the service controller to monitor the workings of the computer room from the offline area.

Service controller Keith Partridge said, "From here I can check that the work schedule is being kept to. For example, I can tell which applications are being run by the number of tape drives in use."

Staff are deployed between the technical and less demanding tasks on a rota basis. This ensures that they get good all round experience and adds variety to the work.

Trainee operator Tom Roberts, an Australian who has been at the site since last May, told me, "It would be easy for the service controller to put you on a job and leave you there for a week or so, but he doesn't.

"One day you might be making up work, on another operating the system, and on the next doing some quality control."

Tom is due to be promoted to operator grade and is keen to get as much online experience as possible.

He continued, "There's a lot to be learnt, especially on the 1904S. But you can also pick up a lot offline, such as when you are making up work. I'm ambitious. Eventually, I would like to move into operations support."

Supplying the company's six food depots with picking list and delivery information is one of the most important tasks performed by the department.

Dave Spikesley said, "Tapes are produced as a by-product of our four food systems."

And the operators, as a part of their offline duties, use Centronics transmitters to send that data to the depots. Each depot has a Plessey receiver and two Centronics printers.

He continued, "The run takes place between 6.00 and 8.00 pm. It's very important that the information is relayed the same evening to allow the depots to pick the goods for delivery to the stores the next day."

Centronics operation is very "labour intensive" and takes up one person full-time. The equipment is due to be replaced "very soon" by two ICL 7502 terminals and two hardcopy printers at each of the depots.

"The depots will be able to get direct access to our files and pull off what they need. It will save the operators a lot of work," he said.

Members of the systems support group work days only, but may be called upon to help the operators with operating system-type problems at any time.

Penny Fenner told me, "We are an online support group and help anyone who has immediate problems. Although that includes programmers, we tend to react more to what happens in the computer room.

"Each of us has a radio page, and we are set up so that we react to any problems on the 1904S or 2970, any time day or night."

According to Penny Fenner, the operators sort out many 1904S problems by themselves, and are learning about the 2970 as time goes on.

She said, "On the 2970, they are improving with experience. They do some first-line dump cracking, using a guide produced by systems support."

In addition to "fire fighting," the group is responsible for the maintenance, updating and back-up of the operating systems. Two of its members are dedicated to building steering files, generating system-type macros and updating and repairing the 2970 system.

She continued, "If we are putting patches on the supervisor, or changing the BMEEP environment on the 2970, we will prove, in a dedicated session, that we can get the system back to its original state within half an hour."

The technical support group is divided into two sections, software and production.

Harry Godfrey told me, "Of the two, production support is more relevant to operations. It consists entirely of ex-operators, whose main interest in life is producing macros and run instructions for all production suites."

The section inspects the business specifications of all new systems to see if they are feasible from an operations viewpoint.

"We pass the estimation around the group to see whether or not it is acceptable. If it is accepted, one of our members is assigned to the project to sit in on all the meetings and advise on operational matters."

During the early stages, the production support technician is the link between the operators and the designer of the system. And as it progresses, he writes the production macros which are also used for all the test runs.

Godfrey continued, "When the application is nearly ready, the production support technician will do a familiarisation course with each shift of operators. And we make sure that all the shifts do the final tests using our documentation and the live macros."

The new application will not go live until the operating people are satisfied that it is up to standard. And after it has been accepted, the production support technician is responsible for any modifications.

Quotes

THE following is an assortment of comments made by members of operations management at the site:

"On the 1904S, the operators go a long way towards sorting out their own problems — they are quite superb." — Penny Fenner, head of systems support.

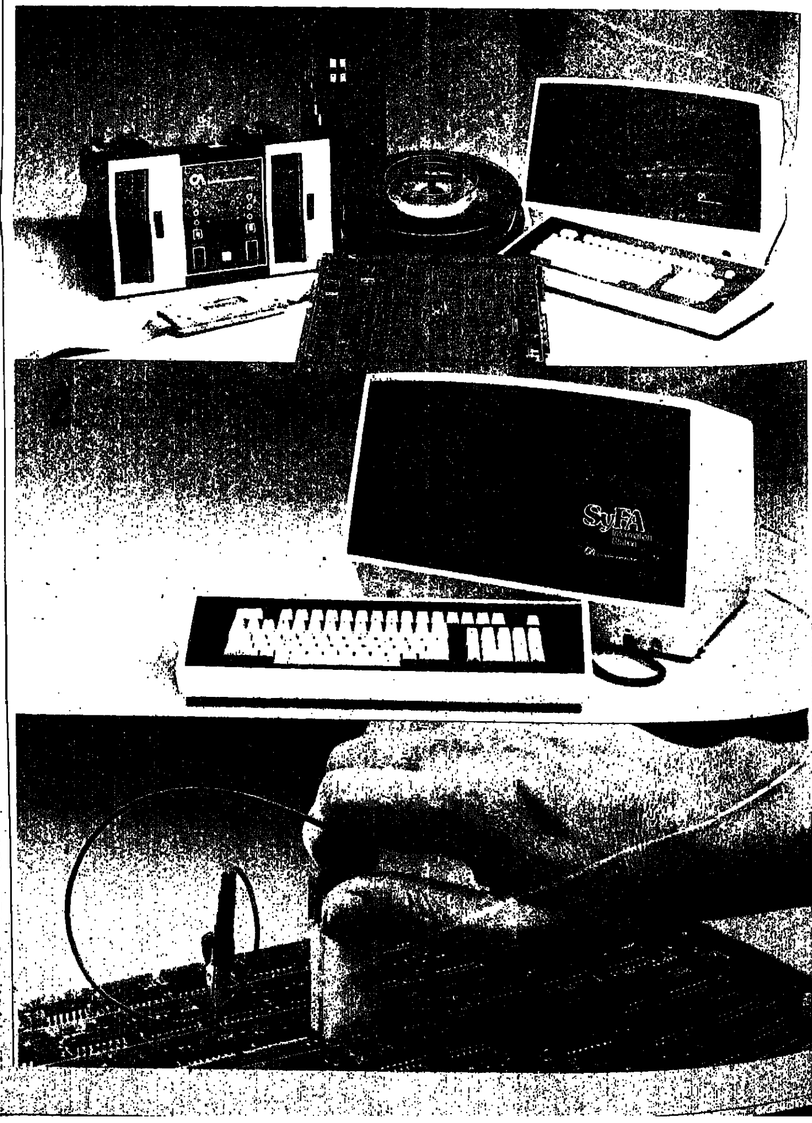
"If we don't get the picking lists and delivery information to the depots, our stores don't get anything, it's as simple as that." — Dave Spikesley, operations controller.

"The production support team is very strong because we can influence the way in which new suites are written." — Harry Godfrey, head of technical support.

"Yes, we have got a strong operations bias, and we have worked hard to make sure that the production unit works." — Terry Mitchell, operations manager.

"We are at the sharp end; we have to deal with the users, whereas if a programmer is a week either way in what he is doing it is irrelevant to the business." — Dave Spikesley.

"My people have a terrific amount of responsibility. They often find themselves in meetings with top management." — Harry Godfrey.



By Bernard Allen

What the workers think

SENIOR operator Malcolm Swallow has five years' experience in operations, including an eighteen-month spell working as a freelance.

He joined Marks and Spencer two years ago and was one of the first at the installation to become involved with the ICL 2970 which was installed in the summer of 1977.

"At that time we had no-one with any VME/B or 2970 experience. Up to that time, most of my experience was on ICL 1900s," he said.

Along with two other operators, he spent a fortnight at the Leicester installation of Hogg Robinson.

He continued, "There we gained some practical experience by operating their ICL 2970 under VME/B. We also played about with some testing files and got accustomed to the OCF screens which, of course, 1900 systems don't have."

Then they returned to Marks and Spencer and were involved in carrying out "stringent" acceptance trials on the machine that the company had been offered by ICL.

"For three days we fed the same job into the system, time and time again, carrying out time and performance trials. It all went pretty well and the company decided to accept the machine they had been offered," he said.

Malcolm Swallow

At Marks and Spencer, the ICL 2970 is used mainly for development work. Most of it runs under BMEEP, ICL's 1900 emulation system, and not directly under VME/B.

Said Swallow, "Having seen the 2970 in native mode, it seems a great pity to use it to emulate a 1904S. In native mode it must be twice as quick as the 1904S."

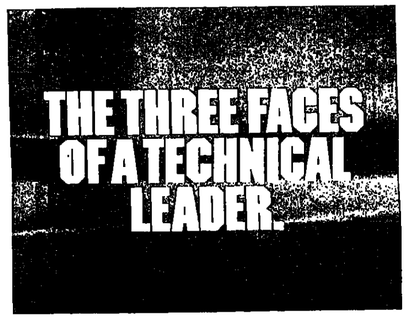
According to Swallow, the target for complete conversion from 1904S to 2970 is 1983.

"We are not just converting systems, some of the older ones are actually being re-written."

The size and many functions of the operations department at the site ensure that there are sufficient opportunities for the operators to further their careers.

Operator Andy Paszkowski has been at the site for fifteen months and would like, eventually, to move into communications.

He said, "Communications must be the thing of the future — the 2970 is built for it. Most of our work is batch, but we do have an export system online to the Baker Street head office, and locally we have Maximop for the programmers."



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US mainframers need to make big price cuts to stay competitive

US MAINFRAME manufacturers will have to do some substantial price-cutting in order to remain competitive with IBM's new 4300 series, but the large-scale minicomputer manufacturers are not seriously affected.

This is the conclusion to be drawn from prices for comparable configurations compiled by New York stockbrokers Oppenheimer and Co. Table 1 below shows prices for configurations comparable with a typical IBM 4341 CPU plus input-output, software, and 48 months' maintenance. Table 2 does the same with a large 4331, and Table 3 with a small 4331.

NCR, already the most competitive of the mainframers on these figures, is meeting this week to decide on its product strategy to match the 4300. Other manufacturers will have to fall in line, believes Oppenheimer's Aharon Orlansky.

Harry Edelson, computer industry analyst with Drexel Burnham Lambert, agrees that the competitors will have to reprice, but points out that they are selling systems rather than simple hardware. He is also recommending clients to buy computer stocks again, after cancelling all recommendations to buy a few days prior to the 4300 announcement.

"Computer stocks have fallen around 10%, and we are now recommending NCR, Data General, Burroughs — and IBM," he told Computer Weekly.

"I am not a doomsdayer," he said. "I don't believe the competition needs to cut prices by more than 20% to 30%. It will have an impact on margins, but margins have been steadily rising. The computer industry typically goes into recession nine months after the economy as a whole, and the US recession is forecast for the end of 1979, so 1980 or 1981 will be the critical year," he said.

IBM 4341	$860,000
Honeywell Level 66/DPS-1	$2,000,000
Univac 90/80-3	$1,900,000
Burroughs B6818	$1,850,000
Itel AS/4	$1,500,000
Digital Equipment DECsystem-2060	$1,300,000
Magnusson M80/4	$1,300,000
NCR 8590	$1,250,000

Table 1

IBM 4331	$480,000
Honeywell Level 64/50	$1,100,000
Univac 90/40	$900,000
Magnusson M/80-3	$880,000
Burroughs B3845	$820,000
Digital Equipment DECsystem-2040	$720,000
NCR 8560	$680,000

Table 2

IBM 4331	$220,000
Data General Eclipse C330	$250,000
Hewlett-Packard HP3000	$230,000
Digital Equipment PDP-11/70	$225,000

Table 3

Two more 4300 models on the way — analysts

TWO more 4300 models are on the way from IBM, New York stock analysts believe.

"I expect a model between the 4331 and the 4341 to be announced in the third quarter of 1979, and one above the 4341 in the middle of 1980," Oppenheimer's Aharon Orlansky told Computer Weekly.

"I expect the new top machine to be 70% to 80% more powerful than the 4341 which would make it more powerful as well as cheaper than the 3031.

"Until it arrives, the 3031 is probably a better upgrade for 148 users than the 4341, though they may choose to rent rather than buy in anticipation of the new machine. I expect the latter to support the MVS operating system."

Harry Edelson of Drexel Burnham Lambert also expects a machine at the top, which he sees as a bridge into the forthcoming H-series. Lending weight to the belief that it is over a year from announcement, he points out that the 64K memory chips on the 4300s are very slow.

"They are not fast enough for a top-end machine, and IBM will have to come up with new 64K chips," he told Computer weekly.

"I expect innovative software which would be easier to use and would support programming from terminals. A fast rate of announcements of new licensed enhancements to MVS might well be bundled together into a new licensed operating system."

He sees the 8100 as the most important of the IBM announcements, and would not be surprised if IBM introduced one of its mainframe operating systems on the 8100.

"It can be used almost as a terminal, and would get low-end users into the DPD fold," he said.

Edelson believes that the 4300 series will affect the plug-compatible manufacturers much more than it affects the other mainframes.

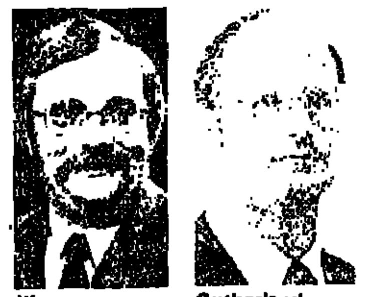
"I think that IBM will make it increasingly difficult to run IBM software on anything other than IBM's own hardware, and as a result I expect the PCMs to go the other way, moving into software of their own. IBM could also make it increasingly hard for software products like VTAM to operate with any but IBM peripherals, forcing the surviving PCMs into peripherals as well, so that they evolve into traditional style mainframe companies."

Traffic plan runs into trouble

COMPLETION of the computer-controlled traffic system for Leeds city centre has been delayed because of the liquidation of the company supplying the video equipment. That part of the contract has now been put out to tender again.

The company, ITC (Southport), which is now in the hands of a receiver, was to install 16 video cameras and the main switching console valued at about £133,000. Competitors for the new contract are Pye, GEC Marconi, Rediffusion and Ferranti.

PEOPLE AND EVENTS



Kite Sutherland

Sutherland for NSC telecom industry

APPOINTED as application engineering manager for National Semiconductor's telecommunication and data processing industry is *James Sutherland, who will be based* at the company's European headquarters in Furstenfeldbruck, Germany. Sutherland's former position was that of application engineering manager for the computer industry, at NSC's worldwide headquarters in Santa Clara, California. Before joining the company he was en*gineering manager* at Electroprint responsible for the design of a 10,000 lpm printer. He has also served as chairman on the committee of many IEEE activities.

Mike Kite has become a sales executive with Sheffield's GMS Computing. He was previously a salesman with Gemini, and before that with Burroughs and Honeywell.

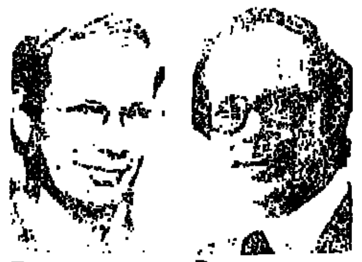
Colin Cook has been appointed by Storage Technology Ltd as sales director for the UK and Scandinavia. Before joining the company, he was *a sales manager with Memorex.*

John Parsons is now managing director of ITR International Time Ltd. He joined the board as deputy managing director in 1978.

Keith Rushton has been appointed as director of Transtel Communications. He was formerly general manager for the company. Transtel is the joint Extel and Extel of America company which manufactures and markets teleprinters and data terminals.

Willard Kauffman has been named as vice-president and director of components production for Intel Corp. He was formerly director of *component production for the company*, joining in 1971 from Fairchild Semiconductor where he supervised semiconductor device and integrated circuit technology development.

Klaus Amann has been appointed European sales manager for Computer Associates International. A former sales manager for Germany, Amann was made managing director



Tory Byrne

for CA GmbH in 1976. **Jim Byrne** has become manager of quality assurance for Computer Associates worldwide. He joined the company's support team as product manager *for VM products.*

David Tory has been appointed international director of marketing for Computer Associates International. He became managing director and sales director of Computer Associates (UK), when Computer Associates International purchased the UK operation of Carus AG, a company formed by David Tory and three others in 1971.

William Baker has been appointed by AMI Microsystems as manager of their principal IC fabrication plant at Pocatello in Idaho, USA. He joins the company from National Semiconductor where he was group director for microprocessors.

Pete Binnington and Grenville Pidd have been appointed by Redifon Computers as customer services area supervisors, for the Southern branch and the Midlands respectively. Binnington was formerly customer services engineer for East Anglia, and Pidd held a similar position in the Midlands.

Dick Mullis has given up the computer industry in which he has worked for the past 22 years. Last week he took over the tenancy of the Britannia Tap pub in West Kensington. He was formerly a lecturer with ICL's Education and Training Division, and before that a *business consultant in the finance division at ICL's City Wall House,* in London. He is seen here at the pumps of the Britannia Tap with his wife, Penny.

Rob Baird has been appointed branch manager for the South East counties (North) for Data General, and **Tom McCallum** has become branch manager for South East counties (South). Baird was previously a salesman for the company, which he joined from Burroughs where he was a sales engineer. McCallum joined Data General from Computer Machinery Company, where he was branch manager. Branch manager for Ireland is **Dick Staveley**, *who will be based in* Dublin. He was formerly marketing manager for Honeywell.

Sandwell scanner fund

THE CAT scanner is now installed at the Walsgrave Hospital in Coventry (CW, August 3, 1978). The cost of £337,000 was met by the people of the West Midlands who raised over £450,000 for the machine.

Now a similar appeal has been launched by the staff at the Hallam and District Hospital, in a bid to raise £500,000 in six months towards the life-saving body scanner for Sandwell's new hospital. The appeal is sponsored by the Sandwell Evening Mail, which is organising a "gaffers" night out at the King's pub theatre, Hamstead.

Executives of Sandwell's top firms are invited to book tables for the evening, and encourage others to join in raising the required amount, the equivalent of £2 per head for everyone who lives in Sandwell.

Donations should be sent to the Scan Fund at either the Hallam or District Hospital, Sandwell.

Scottish office for Prime

The first Scottish office of Prime Computer has been opened at St Andrew House, Glasgow. Sales manager for Scotland is Eddie C[illegible] and the Glasgow office address is St Andrew House, 141 West Nile Street, Glasgow G1. Tel: 041-332 2248.

DIARY

FEBRUARY 22-23
Meeting. IBM CUA Operations group. Norbreck Castle Hotel, Blackpool. 10.00

FEBRUARY 26
Text processing, and colloquium. IEE, Savoy Place, London WC2. 10.30.

FEBRUARY 27-MARCH 1
Which distributed system? Infotech buyer's forum. Regent Centre Hotel, London. Tel: Clive Smith on 0628 35031

FEBRUARY 28
Visit to police headquarters. BCS N. Staffs branch, Staffordshire Police HQ, Cannock Road, Stafford. 10.30.

MARCH 1
Word Processing. Mrs Barkley. BCS N Wilts branch. Churchill House, Wootton Bassett. 20.00.
The social implications of microprocessors. K. Owen. IEETE. Imperial Hotel, St Davids Hill, Exeter. 19.30.

MARCH 2
The renewal of interest in machine translation. R. Johnson. BCS Natural Language Translation Group. King's College, Strand, London WC2. 18.00.

MARCH 5
Mascot — a modular approach to software construction, operation and test. BCS East Anglia branch. Eastern Electricity board, Russell Road, Ipswich. 19.00.

MARCH 6
Voice input — the next computer revolution. J. Saunders. BCS NW London branch. Railway Hotel, Greenford. 10.30.
Word processing. M. Marriott. BCS Cheltenham and Gloucester branch. Gala Club, Fairmile Gardens, Gloucester. 19.30.

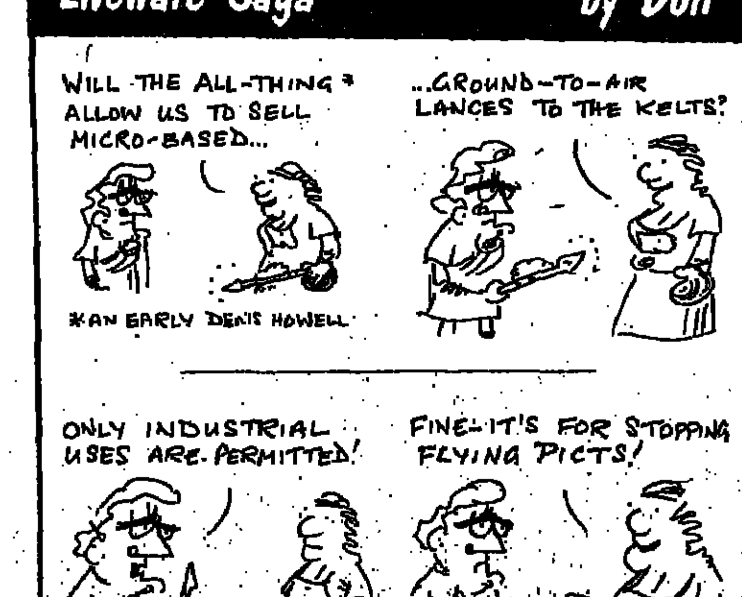
MARCH 6-7
Martex '79. Europe's first specialist exhibition for the leasing and used computer business. Felbridge Hotel, East Grinstead, Sussex. Organised by Walker-Ellis Ltd., 54 Dundonald Road, London SW19. Tel: Tony Ellis on 01-543 1148

MARCH 7
Microprocessor development systems. NCC. Kensington Town Hall, London W8.
Air traffic control. A. McLean. IEETE. Electricity House, Wellesley Road, Croydon. 19.30.
Computer frauds. K. K. Wong. BCS Humberside branch. Willerby Manor Hotel, Willerby. 19.30.
Meeting. BCS Disabled group. BCS HQ, 13 Mansfield Street, London W1. 18.30.
Data analysis Part II. I. Palmer. BCS Database users group. New Engineering block, University of Central London, London WC1. 14.00.
The Chinese army approach to powerful processing. D. Parkinson, BCS N. Staffs branch. Computer Centre, Keele University, Keele. 20.00.
Visit to Traffic Control Centre. BCS Wolverhampton branch. Waterloo Road, Wolverhampton. 18.15. Numbers restricted. Contact Geoff Hamer, Wolverhampton 27371 ext. 44.

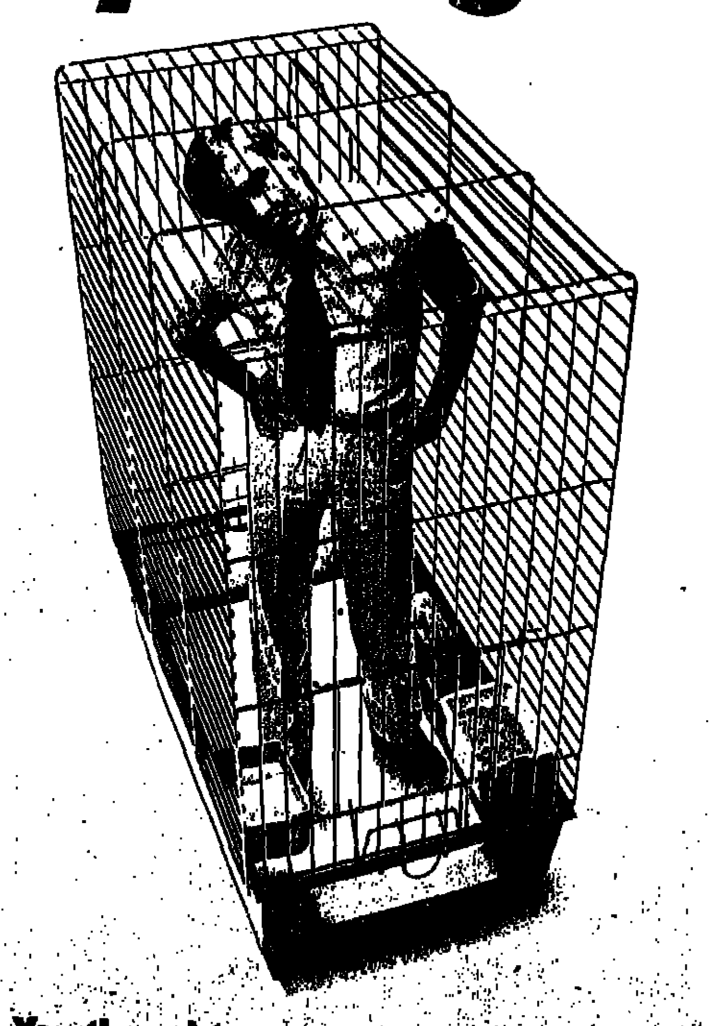
MARCH 8
Communicating with software. P. Macleod. BCS West Herts branch. Heath *Park Hotel, Hemel Hempstead. 19.30.*
Packet switching networks. BCS Kent branch. St George Hotel, New Road Avenue, Chatham. 19.45.
Computers and the smaller business. BCS *Oxford branch. Oxford Europa Mo*tor Lodge Hotel, Wolvercote, Oxford. 19.30.
Visit to Howson-Algraphy. BCS Leeds branch. Leeds. Tel: D. J. Sheppard, Leeds 459825.
Students competition evening. W. H. Edwards, I. W. Draffan and E. Rose. BCS South Yorkshire branch. Heriot House, Sheffield City Polytechnic, Sheffield. 19.30.
Cobol quirks. J. Triance. BCS Newcastle branch. Barras Bridge Buildings, Newcastle University, Haymarket, Newcastle. 19.00.

MARCH 10
Final of schools management game. BCS Belfast branch. Independent Computer Services, Queens Road, Belfast. Closed event.

Liveware Saga by Don



Are you still locked in by that micro chip bargain you bought a year ago?



You thought you were saving money. And ever since you've been losing time, time, time...

Remote control by speech

REMOTE operation of electrical equipment is now possible with a telephone answering system that incorporates a sequential Boolean an*alyser — essentially a 1-bit* microprocessor

Developed by Shipton Communications, System 80 gives the user the normal telephone recording facilities, but responds differently when given a pre-programmed spoken code.

It does not analyse the speech involved, but instead recognises what Shipton describes as "speech bursts." These are monosyllabic sounds which can be arranged in clusters, each being separated by a pause.

Once the code has been accepted by System 80, the user can then give another code designed to operate a specific piece of equipment.

Applications include status checks for unattended computers, shutting them down if necessary, or commercial applications in the banking, accountancy, and insurance sectors. Access to databanks is also possible.

According to the company, installation is simple and cost of a three-year rental starts at £310 per year, including installation and maintenance.

● Once equipped with its answering tape cassette the System 80 machine will respond to voice *instructions to gain access to,* for example, the terminal in the background of our picture.

Itel AS users' group April 'springboard' in Chicago

McCormick

USERS of the Itel Advanced System all over the world are being invited to Chicago at the end of April to attend the first convention of the newly formed Itel users group, Choice, Co-operating Holders of Itel Computing Equipment.

Choice was set up late last year by about 30 Itel customers in the US, many of them ex-members of one of the three IBM user groups — Guide, Share and Common. They were led by Denton McCormick, corporate data centre manager of Addressograph-Multigraph, the first organisation to install the Japanese built Itel AS/6.

McCormick, who is now the first president of Choice, told Computer Weekly: "Choice is not financed in any way by Itel and we do not exist to be directed by Itel, but we have close contact with the company.

"There are people in Itel who will act as counterparts to the six divisions we have set up within Choice: management, operations, software, applications, communications and futures.

"The Chicago convention will be held from April 25/27 and we hope that it will act as a springboard for future activities. One aim is to encourage members to form sub-committees within each of the six divisions.

"*Our plan is to hold* two conventions a year and the next will be held between September and November probably also *somewhere in the US. I don't* think there will be enough members in Europe, initially, to form a separate European group."

McCormick feels confident [illegible] will not lose touch with IBM software development by belonging to Choice instead of an IBM sponsored group.

"We will liaise with Itel on IBM software developments and will pressure Itel to keep Choice members completely IBM compatible. IBM compatibility is very important. If Itel announced its own operating system as an alternative to IBM I doubt if Addressograph-Multigraph for one would leap forward to use it.

"On the program products side, many users are already independent of IBM through using non-IBM products.

Call Digital Equipment. We can set you free.

In the reasonably simple world of small programs – say, 512 words – price is still a pretty good criterion.

But once you're up in the 4K/8K numbers, there are a lot more important questions to ask

Like time – how long between idea and product?

Buy a low-cost micro chip now and you may still be looking at it in 18 months – and losing money hand over fist

While a Digital *micro* – LSI-11 *board or* PDP-11/03 box – can be working for you in a fraction of the time

And your finished product will be out there earning money for you while you get busy on other new ideas

If you really want to substantially cut your time between idea and product, you'll be smart to check our *packaged versions. They're the* ideal way to speed things up.

This is not to say that they're cheaper than micro chip bargains. No way. You pay for what you get.

But you'll save significantly on development costs.

And you'll probably save about six to twelve months of your life.

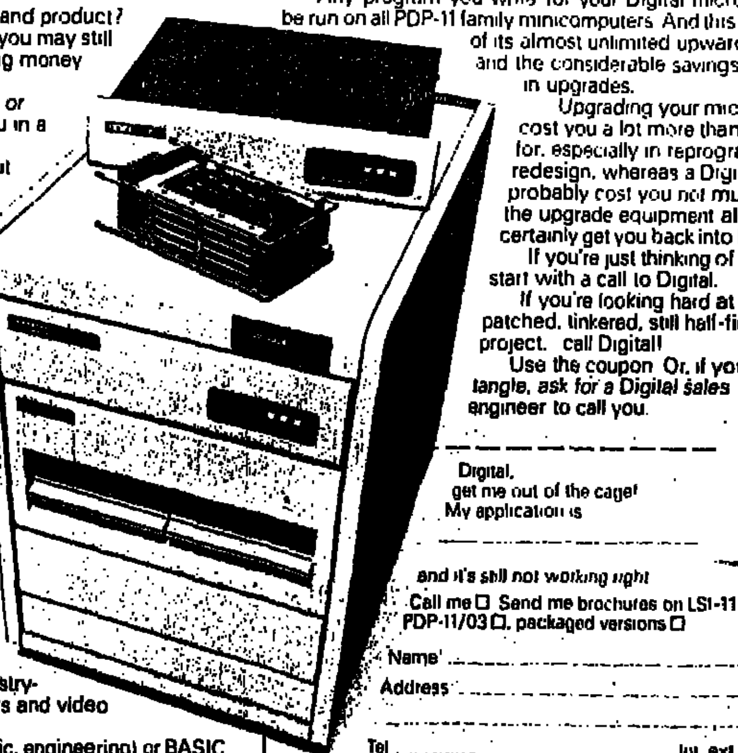
Digital micros are designed to be very simple and easy to interface with – either general purpose interfaces or your own easy-to-implement design.

And they also team up easily with much of the software and systems wardrobe of the Digital PDP-11 computer family.

Random access floppy disk systems, powerful real time systems – RT-11. Industry-standard peripherals – DECwriter printers and video terminals.

Languages like FORTRAN IV (scientific, engineering) or BASIC (conversational) *as option.*

The boxed PDP-11/03 is the size of a stereo receiver. It comes with 8 KB (RAM, ROM or CORE) and can expand to 56 KB



It's as at home in the laboratory as it is in shop or office

And it belongs to a family that's as much at home working the smallest machine tool as it is when running a railway system!

Any program you write for your Digital microcomputer can be run on all PDP-11 family minicomputers. And this is an indication of its almost unlimited upward expandability and the considerable savings you can make in upgrades.

Upgrading your micro chip could cost you a lot more than you bargained for, especially in reprogramming and redesign, whereas a Digital system will probably cost you not much more than the upgrade equipment alone – and certainly get you back into business faster

If you're just thinking of computerising, start with a call to Digital.

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Use the coupon. Or, if you're in a real *tangle, ask for a Digital sales* engineer to call you.

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...IN BRIEF

Switch to digital

DEVELOPMENT work has stopped on the West German PTT's EWS range of analogue stored program control telephone exchanges in favour of digital systems. After investing more than £100 million in it over the last 2¼ years Siemens, the major manufacturer, has agreed with the Bundespost that it would be outdated before it was installed.

Provision of digital switching equipment is expected to be *opened to competitive tender,* making Standard Electrik Lorenz a major contender with parent company ITT's System 12 *main exchange.*

Ferranti offshoot

FOLLOWING successes with simulators for the Royal Australian Navy, message switching systems for the Department of *Transport, and a motorway* traffic control system, Ferranti has formed an Australian subsidiary, Ferranti Computer Systems, to go after business involving real time systems in both military and civil applications.

French DP link-up

TWO giant French concerns, Publicis and the Express group, have agreed to set up a jointly owned services company, merging their data processing interests. The new company, Unigest, *will take control of two existing* subsidiaries

Scottish first

THE first ICL 2950 to be installed for commercial data processing in Scotland has been delivered to the Edinburgh offices of stockbrokers Wood Mackenzie and Co. The 2950 will take over all the present workload of a 1902S

Sperry takes off

FLIGHT management and digital air data computer subcontracts for the new Boeing 757 airliners have been won by Sperry Flight Systems in the US. The system consists of two modules: a main processor based on a Sperry designed LSI processor, and an Intel 8085 based control unit. *It also uses a 4* Megabit mass memory disc system, developed by Sperry, to compute flight paths.

Protocols unit set up

● From front page

work this year and is just now concluding its initial assessment *of what needs to be covered. It* will be contributing directly to the work of the ISO committee.

According to consultant Hugh McGregor-Ross, *transactions* between word processors will be mainly in the form of files, even for very short messages, because most documents to be transmitted will be one or two pages long.

Since file formats on word processors vary enormously, there will have to be an elaborate standard form into which documents can be translated at one end and retranslated from at the other.

Sophisticated word processors provide many features such as protected areas of text, *automatic line* and page wraparound, subscripts and superscripts, special character sets, and tabs and tables, which require a very *complicated file* format.

If a document is transmitted as a simple string of Ascii characters, these *features* will not be usable at the other end, therefore a standard for files as well as the character set is necessary.

Several standards will be produced, says McGregor Ross, covering a wide range of machines and applications from the simple to the very elaborate. To avoid re-inventing the wheel, the text standards people will look carefully at the work of related committees to see what *standards that have already* been produced can be adopted wholesale.

In particular, the ISO committee working on the general computer communications problem of "open system interconnection" will be approached and asked to produce standards appropriate to text communication.

In the middle of the range of sophistication, McGregor Ross says, is the CCITT's proposed Teletex service (not to be confused with teletext, which is the generic name for broadcast services such as Ceefax and Oracle).

This is a text communication service to be offered by PTTs, consisting of typewriter-like machines in offices with editing facilities and a buffer store. These would communicate *either by the public telephone* network or data network unlike Telex which has its own network.

● *Post Office future network* — Page 13

No Luddites here, says the IDPM

NO offence was taken at the picture painted by Professor David Barron (CW, February 8) of "IDPM following the print unions into a last ditch stand against the new technology", since no doubt it was offered as a debating point.

We can say quite unequivocally that no organisation has done more than this Institute to make its members aware of the changing scene and the need to move forward with it. This is not the same as rushing out to buy a gaggle of minis and micros imperfectly tied together in what some vendors choose to call distributed processing. What we have been saying and writing with what must seem irritating frequency is that our members must first establish the facts, then quantify and evaluate them before finally making appropriate recommendations to management.

We are quite clear that if there is a good case for a partial or complete dismantling of the centralised mainframe, then if our members do not make the recommendations, somebody else will and the professional DP staff will be effectively isolated.

But above all, I am quite convinced it is the DP professional staff who are best equipped to guide a company into the distributed world of minis and micros. The company which allows a proliferation of incompatible devices in each of the user departments by virtue of uncontrolled development is destined for more trouble than it can probably handle.

Being a very practical organisation, headed by a council concerned with the practicalities, we have also addressed ourselves to the problems of how to ensure that our examinations reflect the changing scene.

Finally, it will not be lost on readers that it is IDPM which has established a Working Party on Microprocessors, a Microprocessors Users Group and has chosen the Management of Microprocessors as the theme of its AGM/conference on May 23, at the Bloomsbury Centre Hotel.

It is a matter of record that the initiative for several of these resulted from a microprocessor Forum held in conjunction with Computer Weekly last autumn, when over 100 attended.

We are also conducting both a mass survey of our members on the subject as well as in-depth surveys with a number of selected companies. In conjunction with Informex, we are also running two-day seminars on microprocessors at the Cafe Royal on four occasions this year. There is no other organisation doing as much and I am sure that Professor Barron will agree this is not exactly the profile of a Luddite.

EDWARD G. CLUFF,
Secretary-General
IDPM.

LETTERS

To: The Editor, Computer Weekly,
Dorset House, Stamford Street, London SE1 9LU

Courses for analysts

I READ with interest the points raised by Judy Cox (CW, January 18) regarding the unavailability of courses for business systems analysts who lack the necessary appreciation of the business environment.

I would like to point out that this need has already been recognised and that such a course is now available. The five-day course, run by Infotech International, is entitled Corporate Systems Analysis Workshop. It examines and practises techniques of corporate analysis, corporate accounting and cost benefit analysis, and the analytical and communications skills essential to ensure that DP resources focus on corporate needs.

COLIN STEED
Infotech International
Maidenhead.

Hoist by his own jargon?

I RATHER think that G. A. Taylor (Letters, February 8) has been hoist by his own jargon. My OED disclaims all knowledge of "baustrophonic" — which doesn't mean much these days, I agree — so I suspect that he meant "boustrophedonic." My friendly neighbourhood ox (who works for Ouma) agrees with me.

DAVID JONES
East Twickenham.

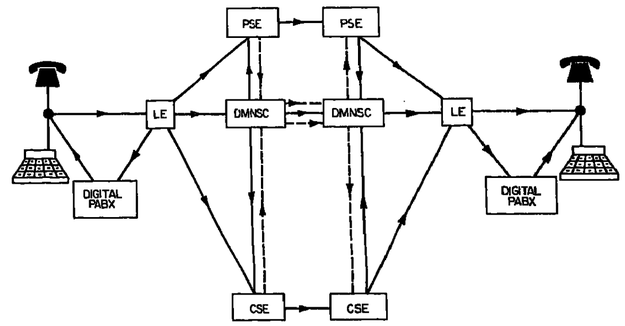
Humberside library programs

IN A report headed "Londo Schools to get 30 Micros" (Co January 18), you draw attenti to the Humberside School Computer Library Service. Unfortunately your Informatic regarding the service is inaccurate.

The Humberside Schools Library currently contains about 100 programs (not 500 as stated). These are drawn from a number of sources and cover a number of subject areas including a games and miscellaneous section. One of the programs in this latter category is an enhanced version of Mike Mayfield's Startrek, but at no point has this program accounted for 80% of the library's use as you report. It is true that we are currently concerned about the relatively high usage of the games programs, as opposed to the more academic material, but the situation is not as your story infers.

RICHARD GREEN
Humberside Schools' Computer Library Service.

Post Office PSS and System X to integrate in the 1980s



How the final integrated services network will look. PSE means packet switching exchange; LE, local exchange; DMNSC, digital main networking switching centre; and CSE, circuit switched exchange.

THE Post Office Packet Switched Service, which is due to go live early next year, will be integrated with the System X all-digital, all-purpose telecommunications network when the latter is in operation. This will not be before the late 1980s.

The Packet Switching Exchanges (see diagram) will be linked to the System X Digital Main Networking Switching Centres (the System X trunk exchanges), and users of PSS and System X will be linked into each via the Local Exchanges.

Like all the other exchanges in the integrated network the LEs will use digital switching exclusively.

System X will combine voice, data, facsimile and a variety of other services and will provide Datel services similar to those available on the existing analogue network. But terminal users will not need expensive modem equipment because the digital interface at the local exchange will probably be not more than a mile away.

The Post Office is developing a low-cost network terminating unit that would be used instead of a modem, but even this would not be needed by users with a PABX that carried out pulse code modulation.

Private digital data circuits using System X could be available as early as 1983 between major cities although full-scale Datel type services on System X will not be introduced before the late 1980s.

The lower part of the diagram shows how a circuit-switched digital data network could be integrated with System X if such a network were to be introduced by the Post Office in the 1980s. Its introduction will depend to a large extent on how quickly the middle, System X, part of the diagram becomes operational. The sooner this happens the less likely will be the introduction of such a data network because System X will provide highly efficient circuit switching for voice and data at 64K bps.

Another factor determining whether a UK circuit-switched data network will materialise will be the extent to which the other European PTTs go for circuit switching.

The West German PTT, in the form of Datex, and the Scandinavian PTTs, in the form of the Nordic data network, are already implementing circuit switched networks, but the French and Swiss PTTs have postponed their plans for circuit networks. The French packet-switched network, Transpac, has now gone live (CWI, January 11).

Digital circuit switching offers several advantages over packet switching. It can handle large data volumes more efficiently than packet switching, it provides the user with a transparent channel and it employs a protocol, the CCITT standard X21, that is far less complex than the X25 standard for packet switching. On the other hand, circuit switched data networks are more expensive to implement and run than packet switched.

The French and Swiss PTTs, like the UK Post Office are waiting to see whether their own System X type networks will be up and running soon enough to obviate the need for a circuit switched network dedicated to data.

The Post Office expects PSS to have 4,500 users by 1983, and that by then PSEs will be in operation in Glasgow, Edinburgh, Leeds, Cambridge, Reading and Bristol as well as in London, Birmingham and Manchester. The Post Office expects its viewdata service, Prestel, to be using PSS in five or six years, as predicted by Computer Weekly (CW, June 29, 1978).

Refunds for immigrants

● From front page

the Fair Trading Act applies only to UK residents, and the students in these cases all come from overseas.

Refusal of entry often arises when immigration officials suspect someone plans to stay on in the UK after a course finishes, and the UKIAS feels that advertisements in foreign newspapers sometimes imply that it will be easy to find a job here after the course and therefore to take up residence. According to law, they must return home and can only come back if an employer here first gets them a work permit.

Cases have been reported recently in the Birmingham area where resident immigrants paid for courses for relations overseas, only to find they could get no refund when the relations were refused admission.

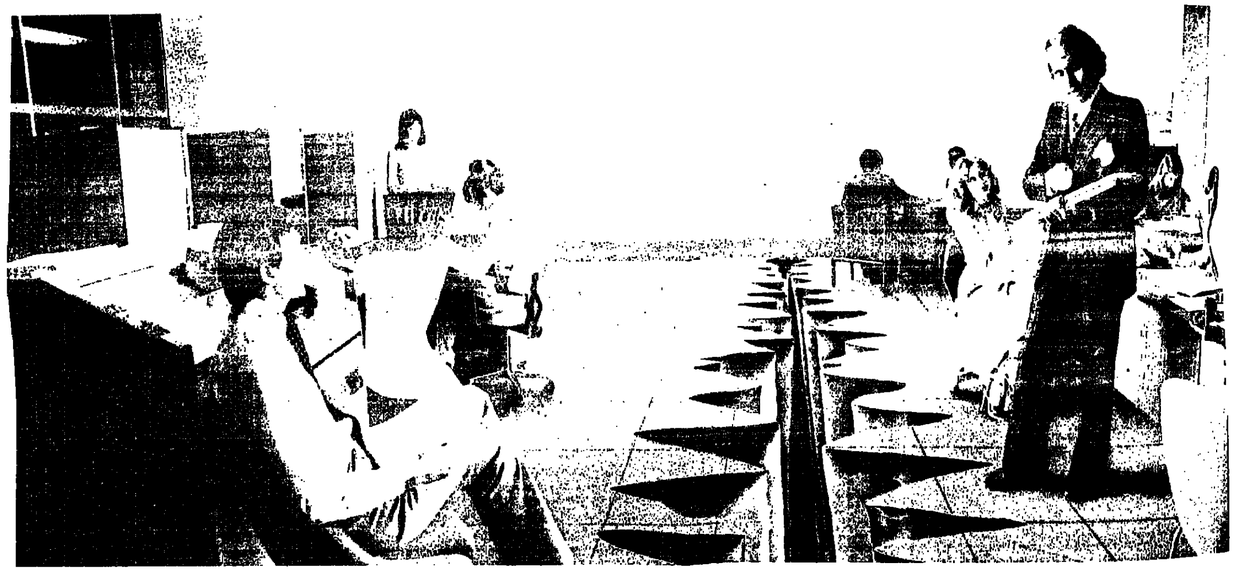
...olume copying machines for UK

TWO new copiers aimed at the low-volume market have been introduced in the UK, one by Rank Xerox and the other by Pitney Bowes.

Xerox's machine is a compact, plain paper copier called the Xerox 2202. Features include copying of originals from A4 to B4 in size, a special "copy darker" key to handle faded originals, and a single-sheet feed mechanism that allows both two-sided copying and the insertion of coloured sheets of paper among white sheets. Price of the 2202 is £1,740.

At the same time, Pitney Bowes has launched its new 458 dry-tone copier in Europe and the US.

A table-top model, the 458 is said to be ideal for small to medium size companies which require an average of about 1,000 copies per month. Variable length — from 14 cm to 35.5 cm — copies can be made and the company says that it has approximately half the number of parts of most copiers. It costs £960.



How to close the 'Software Gap'

Many businessmen have been disappointed by the information they receive for strategic decision-making. It is often too little, too late and too expensive.

Filling the gap between the ever-changing needs of the user and what computer systems provide is really the key problem—a problem we at Cincom have done something about.

Cincom's family of information systems software closes the gap.

First, give the end-user access.

Cincom's new T-ASK is an on-line interactive query facility for end users. Ad hoc and repetitive questions that once required special programming now no longer do.

T-ASK is a "user-friendly" system. With easy to use commands, the user gains access to the data he needs through his own terminal.

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TOTAL 8.0 provides superior performance. It is fully multi-task, multi-thread, offers VSAM support, reduced CPU usage, and many other new facilities.

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In addition to T-ASK and TOTAL 8.0, Cincom Systems offers a full range of data base and data communications products that help close the software gap.

We also feature specialised application systems software and Custom Systems support.

These products and services are backed-up by a complete network of technical product support, system engineering and educational facilities.

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Desktop combination reader/punch with serial asynchronous RS-232C compatible interface. Designed to operate with a terminal device on the same serial data lines or tone on a dedicated serial line.
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Punch accepts data at all standard baud rates up to 600 baud continuous or 4800 baud batch, utilising a 32 character buffer.
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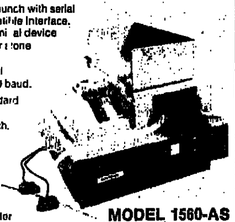
Tape duplication feature is provided by suitable unit to LOCAL mode.



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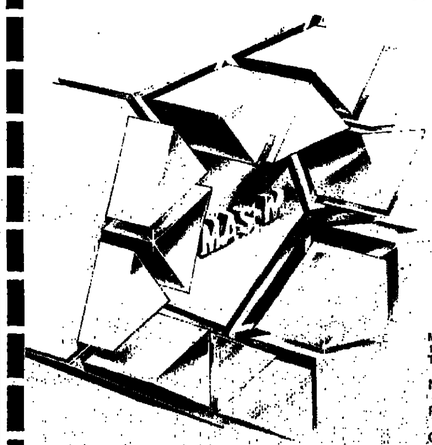
MAS-M is supported world-wide. In the U.K. alone, Hoskyns employs over 500 d.p. professionals.



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Standardisation of bus structures

Last November, Micro News published an article by Dr RICHARD STEVENS on the S-100 bus that discussed how it has helped to provide low cost small computers with some surprisingly sophisticated capabilities. It was an article that prompted considerable response, both for and against S-100.

The question of standardisation of bus structures is one that will grow in importance as more microcomputer systems enter the marketplace, so this week Dr Stevens continues to look at the subject, pointing out that standardisation is rarely based on logic or morality, but upon reality.

THE S-100 bus has become the standard bus structure for 8-bit microprocessors, especially for the family of chips manufactured by Intel and Zilog. When I wrote an article on the bus (CW, November 23, 1978), I must admit I never expected to arouse such interest (and abuse!) on such a dry subject.

However the definition of a standard bus is a vital factor, perhaps as important as the standardisation of a computer language.

Consider how the Digital Equipment Corp has benefited from its definition of the Unibus (a DEC trademark) for the PDP-11 family.

In practice, if not in theory, DEC is relatively free about what is plugged into the bus, and it has gained enormously from this attitude.

People buy DEC computers because they know that any peripheral you care to mention will be able to interface to it, and buyers benefit because they are not tied to DEC for every item they require. Everyone has much to gain and little to lose by the acceptance of standardisation in this area.

Before replying to letters received about the article, I would like to recap on a few of the main points.

1. There are between 50 and 100 manufacturers (almost all in the US) who make an enormous range of boards for the S-100 bus memory (RAM, ROM, PROM, EAROM) disc controllers, A-D, D-A, speech input, speech output, modems, video, hardware multipliers, main controllers and many others.

2. The practical problems in fitting boards of different manufacturers into a system are generally very small. I realise that it is pointless to repeat this to people who believe there is something fundamentally wrong with the bus, but this viewpoint is based on three years' experience on many different boards. In any case, many customers will be buying from a single manufacturer, benefiting from point 3.

3. S-100 boards are usually very well made and, because of the severe competition, extremely cheap for their performance.

For example, a US firm now sells 64K bytes of 200 nanosecond memory on a single card for $695. It uses 16K bit dynamic RAM chips, so the cost of each chip with its fraction of the printed circuit board, logic, chip socket and power supply regulator is about £11! You can buy a disc interface for the S-100 system from Calcomp for only £430, compared to the cheapest DEC Unibus storage module interface at about £2,000.

This gives you some access to the low cost, high reliability Winchester type disc drives made by CDC Okidata and Kennedy, as well as the whole Calcomp Trident range.

The Storage Module Controller is fast becoming a standard for big disc systems (Oh no! What have I said?). So, for about £3,500, you could have an 80 Megabyte Okidata disc and interface to your S-100 computer.

The S-100 is not an ideal bus. For example, it was never designed with 16-bit micros in mind. The bus was not strongly specified initially but, like Topsy, just grew from the original MITS-Altair microcomputer system. However, we should accept the reality of the situation, that it is the nearest thing to an 8-bit standard we have and is unlikely to be displaced.

It is also possible that the IEEE standard may make it respectable and it will become popular for 16-bit systems. An unfortunate fact of life is that standardisation, especially in DP, is rarely based on logic or morality but upon reality. It is even more unfortunate not to accept this, and to indulge in paper exercises so far from the sound of battle in California.

Two readers have written in to comment on the use of the Motorola 6800 series of microprocessors on the bus. A. J. Aylward, of Gillingham, said that the S-100 bus could not support the 6800 series of microprocessors, whereas G. E. Quick, of Swansea, pointed out that it is already used with the 6800, 6809, Rockwell's 6502 and the Texas 16-bit 9900 processor.

Besides wishing to see a discussion between them, I would like to agree with both. The S-100 system is merely 100 conductor lines in parallel and so, in theory, it can be used for almost any processor that doesn't require 101 lines at any one moment.

The significant point is that the vast majority of systems sold have either Intel's 8080, 8085 or Zilog's Z-80 chips as their main processor and so, for practical purposes, the other processors that have been used can be regarded as irrelevancies.

Of course, the Zilog and Intel chips bear a strong family resemblance as the Z-80 was developed by ex-Intel engineers as an up-market version of the Intel 8080. This process could happen again, because recently Ralph Ungermann has left the boardroom of Zilog.

Quick also said that if UK manufacturers made S-100 boards there would be dissatisfaction with their products, as he has experienced some trouble with some UK microcomputers. In general again I would agree, for the standard of construction of UK personal computer systems often leaves a lot to be desired.

However, CASU Electronics, which has never to my knowledge advertised its products, wrote in from Northwood, Middlesex, to say it makes half-a-dozen different S-100 boards, mainly specialised input/output S-100 cards for its own microcomputer system. Basically intended for office work, it uses Digital Research's CP/M operating system and CASU has written quite a bit of software around this.

The central processing unit card and memory come from CASU but almost all the rest is UK-made. The cards are double-sided, through-hole plated and thoroughly professional looking.

The CP/M operating system has been implemented on many micro systems, and makes it fairly easy for a small firm to sophisticated software ar

Turn to page 17

The standard of construction of UK personal computer systems often leaves a lot to be desired.

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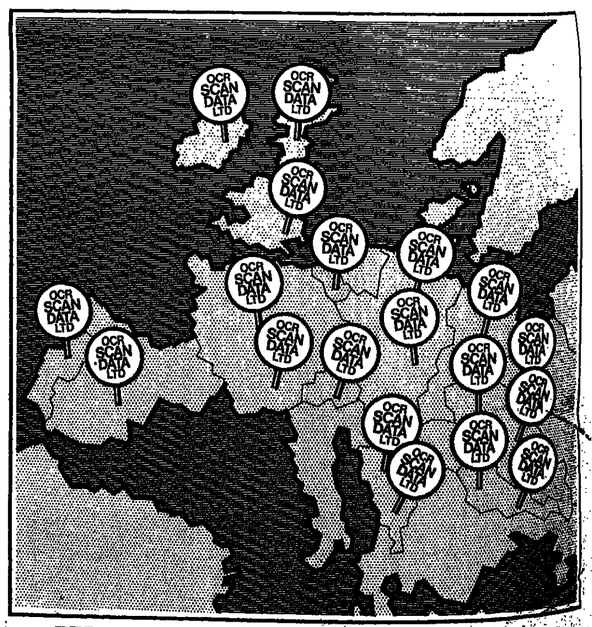

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A Big Name gets Bigger

Recently announced changes by the Perkin-Elmer Corporation of Divisional names within the Data Systems Group complete the process started with the company's acquisition of Interdata and Wangco in 1974 and emphasise Perkin-Elmer's belief in the great benefits of a single-source vendor to the end-user.

Computer Systems Division is the new name for the Interdata Division which develops and produces small and medium-sized computer systems and software.

Memory Products Division is the new name for the Wangco Division, which develops and produces magnetic tape, disc and other mass storage devices.

Terminals Division, which produces and markets a range of video and printing terminals, continues to operate under the same name, as do the Customer Service and International Divisions.

In the UK, Perkin-Elmer Data Systems Ltd markets, services and supports the products of Computer Systems Division, Memory Products Division and Terminals Division.

ONE NAME

Nicholas G. Bark, Managing Director of Perkin-Elmer Data Systems Ltd, said that the changes have been made to clarify, strengthen and broaden the recognition of Perkin-Elmer in the data processing market and he emphasised the Corporation's commitment to that market. "All products that we market in the UK will now be known by the Perkin-Elmer name" he said.

In its fiscal year ended last July, the Perkin-Elmer Corporation has worldwide sales of $581 million, of which some 45% was outside the USA. Data Systems products accounted for 24% of the total.

Perkin-Elmer also produces analytical and related instrumentation, precision optics and electro-optical systems, flame spray equipment and avionic instrumentation, with manufacturing facilities in Connecticut, New Jersey, New York, Illinois, Minnesota, California, the UK and West Germany.

Improved 32-Bit operating system

A new, event driven, multi-tasking operating system for 32 bit minis, called OS/32 R04.1 has many functional and performance improvements over the proven 32 bit OS introduced in 1974. The Perkin-Elmer single integrated system can be applied to commercial transaction processing and scientific number crunching.

The software, used with the Perkin-Elmer 7/32 and 8/32 computers, costs £950 including installation and a year's membership of the Perkin-Elmer software subscription service.

PERFORMANCE IMPROVEMENTS

To maximise task throughput genuine I/O queueing is provided at task level and the OS I/O overhead has been halved.

DMA and Seek scheduling improve DMA bus utilisation and disc loading, thus maximising system throughput. The new OS/32 Edit deals with large files hundreds of times faster than previously. Other features prevent file loss and simplify operations.

The Multi-Terminal Monitor option for program development has also been improved. The previous limit of 16 terminals has been lifted and a combination of 32 interactive or batch devices can now be supported concurrently.

Packaged Fortran V11

Two Fortran VII-based packaged computer systems are now available from Perkin-Elmer. Each combines the powerful 32-bit Model 8/32 Megamini® with the globally optimising Fortran VII introduced last October. Perkin-Elmer now offers the fastest Fortran execution in the industry, enabling users with such applications as scientific research, simulation, industrial automation or data acquisition to develop application programs as fast as or faster than any other mini-computer system.

TWO SYSTEMS

The smaller system, priced at £6,880, includes a Model 8/32 with 512KB of main memory, high speed floating point hardware, 10MB disc, 800 bpi magnetic tape, a Carousel console, Dynamic OS/32MT multi-tasking operating system, CAL Macro Fortran VII, system diagnostics and complete documentation. The larger system has 768KB of main memory, 67MB disc and the Fortran Enhancement Package with 2K writable control store and is priced at £94,000.

HIGH SPEED

To quote Marketing Manager Gordon Ambidge: "Fortran VII is so fast that it has taken programs that have run on our 32-bit processors and executed them anything up to 300% faster. During program development, Fortran VII programs can be compiled at speeds exceeding 1500 source lines per minute. Automatic job control allows Fortran programs to be compiled, linked, loaded and executed with a single command input.

Imperial college first with Fortran V11

The Industrial Automation Group at London's Imperial College is about to take delivery of a Perkin-Elmer 8/32 Minicomputer System which includes the first UK installation of the new globally optimising Fortran VII package recently announced by Perkin-Elmer.

INDUSTRIAL RESEARCH

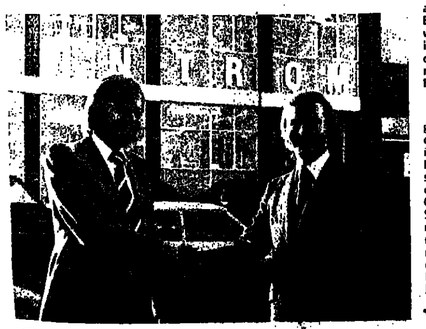
The Group operates at post-graduate level on major research contracts for industry. These have included steel strip mill control for British Steel Corp and GEC, energy saving for BSC and production control for the Science Research Council's Teaching Company Scheme. The approach involves multi-variable analysis, dynamic modelling and optimising techniques, requiring some very hard computing and a 'conversational' facility. With increasing demand for large-scale simulation, a decision was made some twelve months ago to supplement the College's sophisticated but heavily loaded computer facilities with increased capacity.

PERKIN-ELMER CHOSEN

With financial aid from the Science Research Council assured, the Group set about the task of evaluating suitable equipment.

Within a fixed budget allocation, the specification called for a totally integrated 32-bit system for fast processing and reliable back-up.

The chosen system, a Perkin-Elmer 8/32 processor with 512KB of memory and 67MB of disc, a 600 lpm printer, terminals and graphic displays, together with the Fortran VII package, was judged best buy. The Group now eagerly awaits the imminent installation of this exciting additional facility.



Sintrom Appointed Distributor

Perkin-Elmer Sales Executive Tony Beswarwick seals the deal with Sintrom Sales Manager Ian Priestley, appointing his company as the first stocking distributor of the new Perkin-Elmer Bantam low-cost VDU.

Sintrom is well established and highly respected, with a strong and efficient service and customer applications force.

Introduction of the Bantam represents a powerful thrust into the UK market by the Terminals Division of Perkin-Elmer, with a highly competitive terminal. At a one-off price under £600 and substantial quantity discounts, it offers probably the best price/performance currently available.

Perkin-Elmer at Cranfield

Three Perkin-Elmer 7/16 minicomputers provide the very comprehensive in-house signal processing facilities at SPAG (Signal Processing & Application Group), a contract research group within the Cranfield Institute of Technology.

Cranfield is an independent institution mainly devoted to post-graduate and post-experience education and research in the industrial applications of engineering, science, technology and management.

The first Perkin-Elmer system was installed some eight years ago and SPAG have since been regularly buying at least three systems per year for their own use or as part of turnkey signal processing systems for major clients.

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CHESSLAB

By DONALD MICHIE

The challenge of lost-in-two-ply patterns

In this Chesslab Donald Michie presents a challenge to chess-playing programmers. The task is to write a program able to say of any position whether it is "lost-in-two-ply". Entries should be sent to Professor Donald Michie, Computer Weekly, Dorset House, London, SE1 9LU. Envelopes should be clearly marked PATTERNS.

THE theme of pattern recognition in chess has been aired in an earlier Chesslab with an illustration from the ending king-rook-king-knight. The same deceptively simple-looking ending was the subject of a masterly analysis by John Roycroft (CW, 10 August, 1978). Today we consider the task of spotting "at a glance" (supposing that it is the knight's side to move) that the game is lost in two ply (ie, one move by the knight's side followed by one move by the rook's side).

By "lost" we mean that the knight's side is checkmated, or that he has lost the knight without compensation (a stalemate position would count as compensation, as also would a position in which he could take the rook in return).

I say "at a glance" because experts and masters do in fact do just this. The alternative of searching the tree of possibilities to a depth of two would be tedious for the human player, and expensive in processor time for program. Why flog the CPU through all the variations if a well-chosen set of neatly coded patterns will do the trick?

But here is the rub, and the substance of this New Year invitation to the demon programmers who assuredly abound among our readers.

How hard a task is it to program the relation "knight's side lost in two ply", and get it right. My conjecture has been that it would be very hard, based on a little experience in our laboratory at Edinburgh. Consequently I took it as a suitable task for a study in semi-automatic programming with my Stanford graduate class during a recent working visit.

The hunch was, briefly, that automatic program synthesis should not be regarded solely as pure deduction from the formal spec, but that inductive inference from examples and counter examples can also play a powerful role.

As far as they went, our experiments were encouraging. We were able to synthesise correct programs automatically, and we did not feel that any of us could have written these programs unaided. That may just be because none of us is sufficiently red-hot as a programmer; hence my desire to calibrate our result against whatever can be done by some of the super-professionals who read this column!

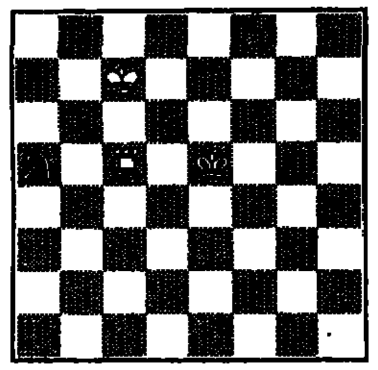


Diagram 1

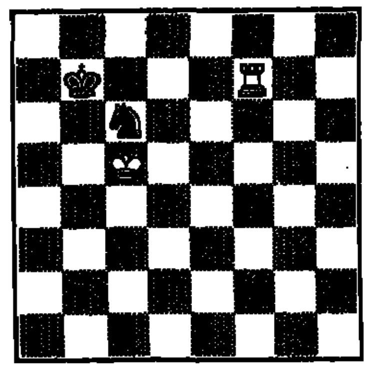


Diagram 2

At first sight, one tends to think that there is not too much in these patterns. Take the positions in Diagram 1, a simple fork. Any fool can see that the knight's side is lost in two ply. But look at the next position, shown in Diagram 2.

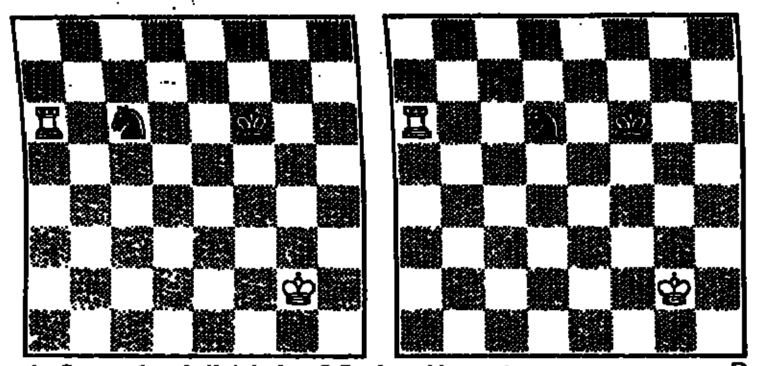
The reason why the knight must fall is here more subtle; but when you have programmed that, how many equally subtle "lost-in-two ply" patterns lurk unsuspected in the total problem space?

To help things along, and to activate the chess-programming centres of the brain, I reproduce an annotated set of examples of the concept, each paired with an illustrative counter-example. From now on, readers, you are on your own.

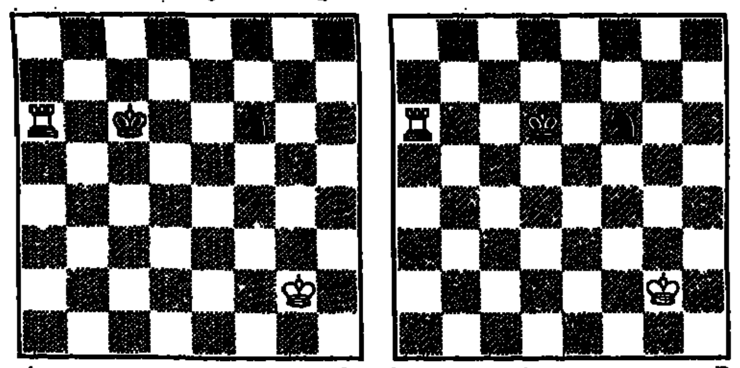
Any program in any of the following languages: Fortran, Algol, Pascal, Lisp, Imp, or POP-2, which the programmer believes to be a correct implementation of my informal spec, should be sent to Chesslab, with specimen output. The output should at the very least include the results of running the program on all the positions printed here.

Timing and store-occupancy data are welcome, also estimates of programming effort (preferably objective estimates, please, including all time devoted to studying any aspect of the problem).

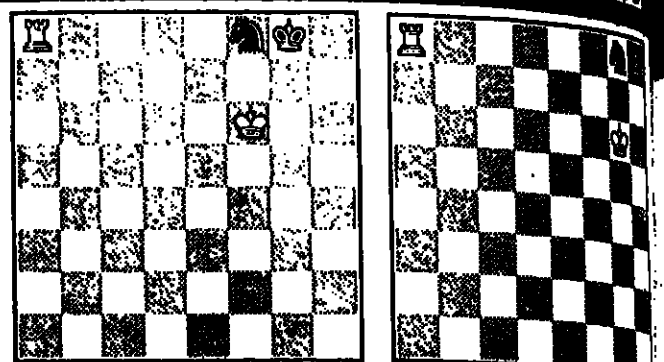
Successful entries will be the subject of discussion in future Chesslabs.



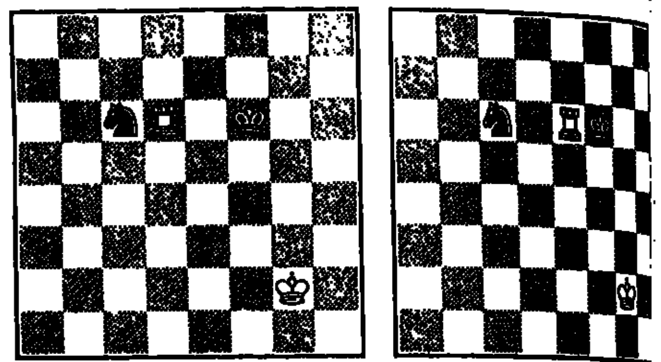
A Pattern 1: A. Knight lost-2-P, pinned by rook. B. King can defend. B



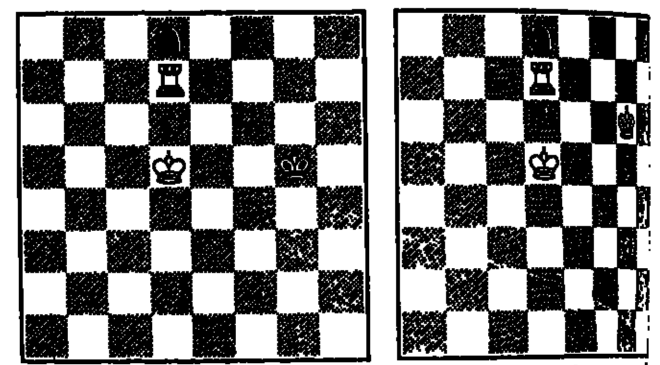
A Pattern 2: A. Knight lost-2-P, skewer attack by rook. B. King can defend. B



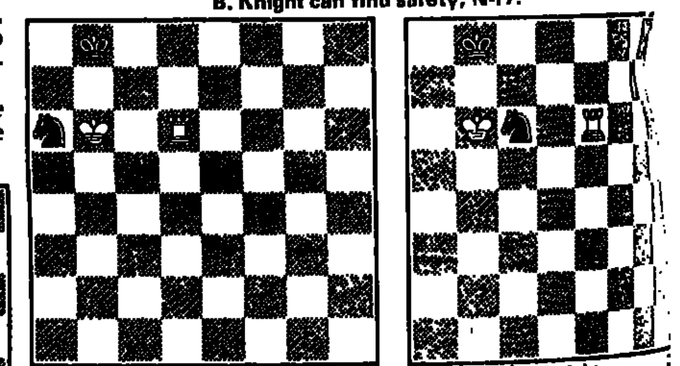
A Pattern 3: A. Knight lost-2-P, king must move away. B. King cannot move, stalemate.



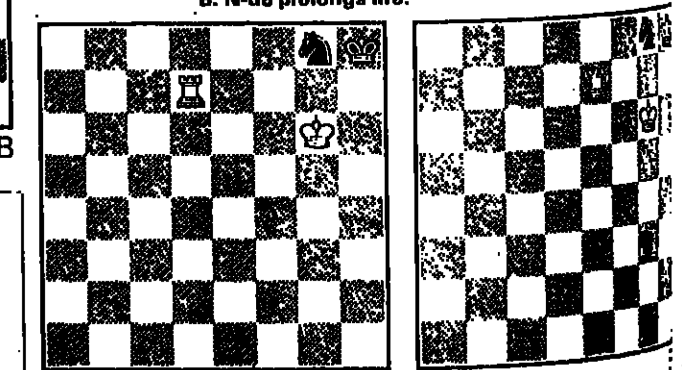
A Pattern 4: A. Knight lost-2-P, fork by rook. B. King can take rook.



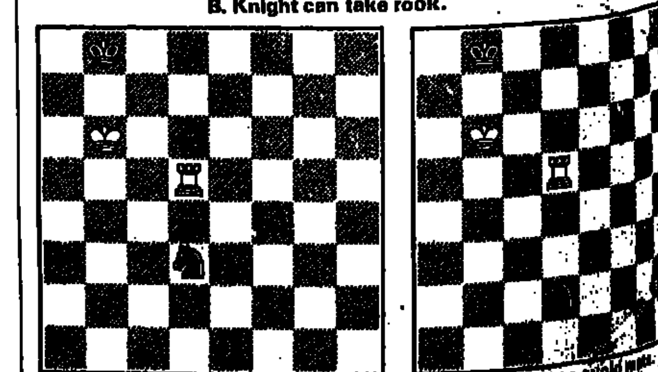
A Pattern 5: A. Knight lost-2-P, all escapes covered. B. Knight can find safety, N-f7.



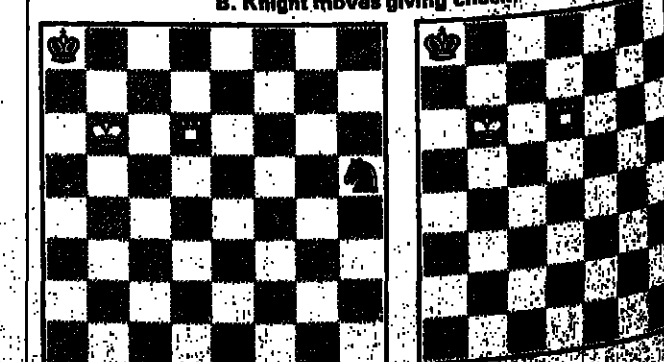
A Pattern 6: A. Knight lost-2-P, dares not move knight. B. N-d8 prolongs life.



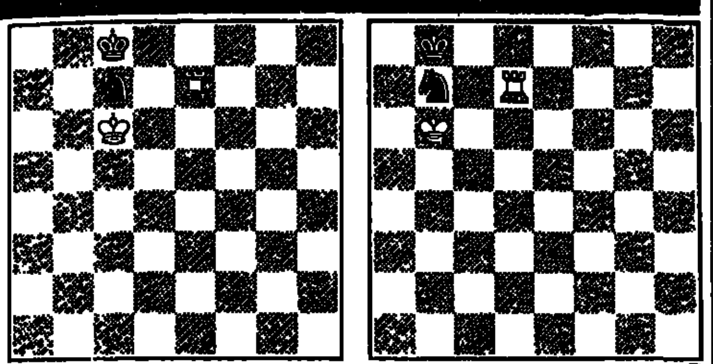
A Pattern 7: A. Knight lost 2-P, knight must move. B. Knight can take rook.



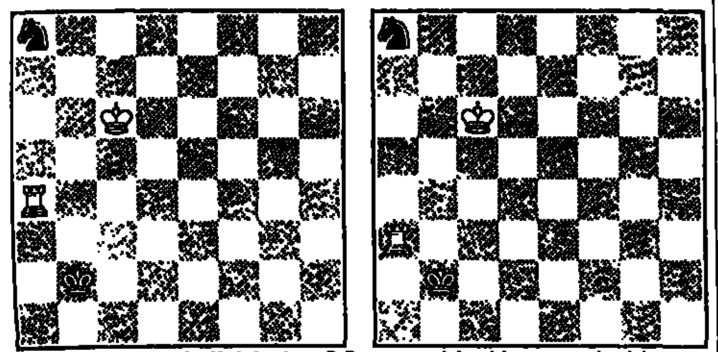
A Pattern 8: A. Knight lost-2-P, king must move to avoid mate. B. Knight moves giving check.



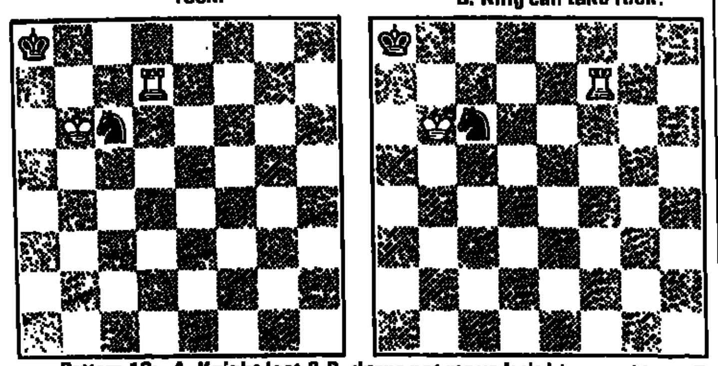
A Pattern 9: A. Mate-2-P, all moves irrelevant. B. N-f7 guards mate square.



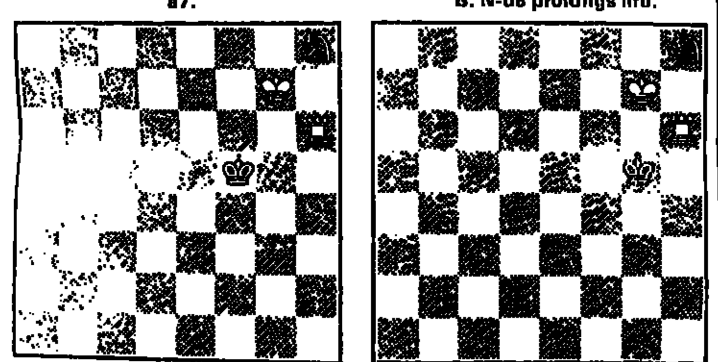
A Pattern 10: A. Knight lost-2-P, N-a6 prevents mate. B. K-a8 protects knight by threat of stalemate. B



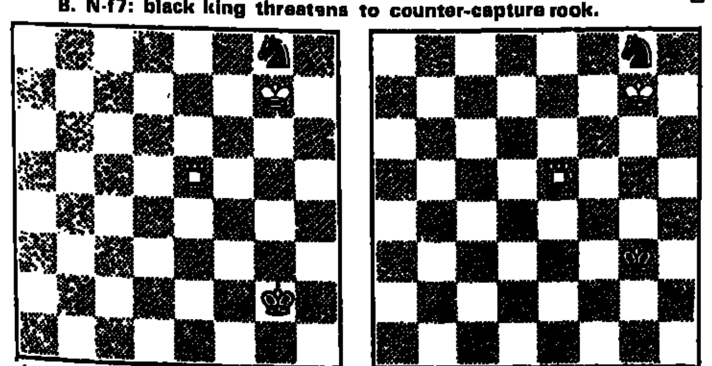
A Pattern 11: A. Knight lost-2-P, trapped by king, attacked by rook. B. King can take rook. B



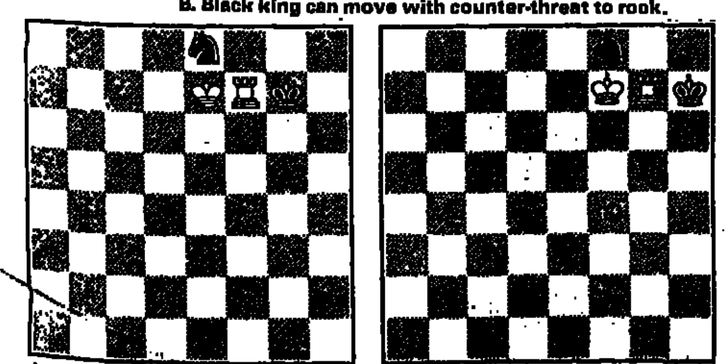
A Pattern 12: A. Knight lost-2-P, dares not move knight except to a7. B. N-d8 prolongs life. B



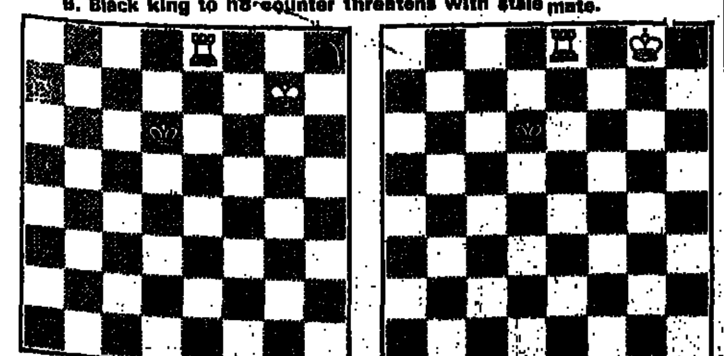
A Pattern 13: A. Knight lost-2-P, no escape. B. N-f7: black king threatens to counter-capture rook. B



A Pattern 14: A. Knight lost-2-P, black king is helpless. B. Black king can move with counter-threat to rook.



A Pattern 15: A. Knight lost-2-P, black king must flee. B. Black king to h8-counter threatens with stalemate. B



A Pattern 16: A. Knight lost-2-P: counter-threat to rook does not help. B. Black king's counter-threat does the trick. B

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'Standards tend to evolve by some process that defies human prediction'

● From page 14

languages on to its system once CP/M is installed.

For example, CASU should be able to buy a California University Pascal compiler and implement it on its system without software patches.

In any case, congratulations are due to a small UK company for developing these high quality S-100 boards themselves. Compare them to ITT which has bought the Apple personal computer from the US and stuck its own label on it to sell it as a small business computer.

One thing I complained about was the lack of a large capacity disc for the S-100 bus. However, Equinox already had such a system in the UK and this was rapidly followed by Calcomp's announcement of a cheap storage module interface. This shows the advantage of a standard bus, because it means that you are not restricted to one *manufacturer for your* peripherals.

Incidentally, CASU also plans to produce an interface to a standard computer tape in the near future.

Moving on from the awful reality of today into the projected perfection of tomorrow there seems to be no doubt there is a requirement for a good 16-bit standard bus.

One problem could be the great differences in architecture between the 16-bit micros. Presumably the "Big Five" in 16-bit micros will be Intel, Zilog, Motorola, Rockwell and Texas and a glance at the specifications of the devices announced so far shows that they are rather more different from one another than were the 8-bit devices.

As a generalisation, there was not much to choose between the 8-bit micros, especially if the date of development was taken into consideration. They were mainly 8-bit data, 16-bit address machines able to access 64K bytes directly.

The Zilog 16-bit Z-8000 comes in two packages, one with 16-bit addressing (64K bytes) and the other with 23-bit addressing (8 Megabytes). The Intel 8086 can *address one Megabyte directly* (20 bits).

The bus situation is further complicated because the devices are also much cleverer than their 8-bit nephews using dual port memories, able to use multiple processors, as well as having different dynamic memory refreshing arrangements.

Furthermore it is very likely that these micros are only interim solutions, perhaps leading to devices with much larger addressing capabilities. After all memory prices are presently halving each year.

Zilog, for one is known to be planning its own strongly defined bus (the Z-bus) for the Z-8000 16 bit micro. No one knows how the 16-bit market will develop. It may stay professional, and it should be recalled that the pressure for the S-100 system came from amateur users. Professionals may be happy to stay with the products of the semiconductor manufacturers, who will use every trick up their sleeves to keep it that way. They will have learnt their lessons from 8-bit experiences and know that the money will be made from supplying whole systems, *rather than just CPU chips* for a single standard bus.

They have many advantages, not least of which is their advance knowledge of their own specifications. The result is sure to be a multiplicity of buses for these chips, at least until the dust settles.

Is it possible that a single bus system will be able to cope with all the future vagaries of 16-bit micros, especially when it is a standard developed 6,000 miles away from Silicon Gulch?

The organisers of the E78 bus standard seem to think so, and it would be very desirable if such a standard could come about.

After all it is a waste of human endeavour to develop five different storage module interfaces or 15 different 64K RAM boards.

Unfortunately, past experience of standards shows that they tend to evolve by some process which defies human prediction though easy to explain after it has happened.

Commonsense will have less to do with the eventual standard 16-bit bus than commercialism. The one thing we can definitely predict about the future is that we shall be surprised by it.

Details of the S-100 and E 78 *standards can be obtained by* sending pre-paid envelopes to: Robert Stewart, 1658 Belvoir Drive, Los Altos, California 94022 USA, or the Secretary The E 78 Committee c/o 209 Albury Drive, Pinner, Middlesex.

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Privacy legislation is seen as a threat to local govt plans

WIDESPREAD moves in local government towards corporate management and unified information systems could be threatened by privacy legislation. That was the principal worry raised at a conference held last week by the Local Authorities Management Services and Computer Committee to discuss the implications for local government of the Data Protection Committee's proposals.

Those attending were all local authority computer and management staff, and several of these expressed concern at the DPC's proposal that information must not be used for any purpose other than that specified when it was obtained. The principle behind many developments in management, they protested, was that information should not be kept in separate compartments but should be managed as a central resource to improve its effectiveness.

One of the speakers, Ken Potts, chief executive of Leeds City Council and a member of the DPC, raised this point himself and said it was not clear how the Data Protection Authority's control over a total local government system would be managed, and how far it was intended that an authority's information could be passed around. Potts was one of the instigators of LAMIS and so was fully aware of the problem.

He emphasised that a great deal of informed debate among authorities on the privacy issue is essential, followed by a reply to the Home Office's call for reactions (CW, February 1).

CW's Rory Johnston will be taking part in the Man Alive discussion.

Man Alive discussion

THE issue of computers and privacy will be discussed on TV next Tuesday, when Man Alive on BBC2 will present a programme on the use of computers by the police.

There will be a film report on the worries some people have about the Police National Computer and intelligence-gathering systems, and this will be followed by a studio discussion. Taking part will be Charles Read from the Data Protection Committee, Rory Johnston from Computer Weekly, Patricia Hewitt from the National Council for Civil Liberties, and John Wilson, assistant commissioner for traffic of the Metropolitan Police.

Although the programme will concentrate on the police and their records, the general question will be raised of whether laws to control computers and privacy are necessary or desirable. Subjects to be discussed include the practicality of enforcing such laws, the moral rights and wrongs involved, and what evidence there is to show they are needed.

Lamsac is setting up a working party to draw up hypothetical codes of practice that might apply to local authorities, and to assess the cost and staffing implications of the proposed legislation. It is also intended that the working party will encourage authorities to adopt the codes voluntarily in advance of legislation.

Several delegates said that there was not enough time before the end of April for all the consultation and preparation of a submission to the Home Office. Over half a dozen complained that they had not even been able to get hold of a copy of the DPC report; they had ordered it in early December and were still waiting.

The need for consultation was underlined by complaints that the DPC's proposals were unclear. "It has left too many doors open," said one delegate.

Disagreement even arose between Potts and Sir Norman Lindop, chairman of the DPC, who was an earlier speaker. Lindop said that the committee had not recommended that all private sector computer applications would be registered. Decisions would be made, he said, over which were and which were not important. Potts, on the other hand, was sure that the intention was ultimately to register everyone.

A question that worried delegates was who would take legal responsibility for complying with the Act. "Who would go to jail?" they asked.

Some insisted that a local authority computer department was acting purely as a bureau, and responsibility over privacy should rest solely on the user departments.

Another pointed out that the standing orders of his authority made the computer manager responsible for all matters of privacy. A great deal was outside the control of the DP manager, it was remarked.

There was considerable debate on whether privacy laws were necessary at all, since no evidence could be produced by any of the committees that have studied this that atrocities have taken place.

"We are in danger of legislating against witchcraft," said one delegate.

Another thought that voluntary codes of practice would suffice.

Ray Ellison of the NCC said that the EEC might force us to legislate by passing a directive to that effect.

Potts defended the notion of privacy laws, but expressed serious reservations about having to implement them by means of yet another quango, the Data Protection Authority. He made an analogy with the Employment Protection Act, which he thought was not properly thought out, not striking the right balance between the rights of the employee and the employer.

He gave as an example the requirement that the DPA would have to "take into account the proper interests of concerned parties."

"But how would it decide what these proper interests were?" Potts asked.

The specific effects of legislation on local authorities' operations are not yet clear, but Ellison listed those he foresaw. Subject access to files would require extensive modifications to systems, he thought, and possibly a special department to aid the public in searching. Relevancy provisions might require quite a lot of reprocessing. There would be confusion over specifying the purpose of information.

As a rough estimate, Ellison suggested £1 million a year as the cost to a typical authority of privacy laws, very little of which would be recoverable in access charges.

He summed up by saying, "Many users could be seriously affected."

Call for a Think Tank on jobs

IN anticipation of the impending information technology revolution, the UK needs a Think Tank to study employment prospects throughout the economy over the next five to ten years.

This proposal was put forward by a discussion group convened by Auerbach European editor Fred Lamond, and Ted Webb, of the Post Office Engineering Union, at a conference on Post Office Telecommunications: The Way Ahead, organised by Information Studies Ltd.

"The proposed body would predict changes in the pattern of employment over the coming decade, identifying which sectors of the economy were likely to grow and which to decline," explained Lamond.

"It was also suggested that a Ministry of Information Technology should be established, which is in line with one of the ideas which came out of the Computer Weekly/ACM Hadley Park conference (CW, July 1977)."

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THE first Amdahl 470 mainframe in the UK has been installed with British Airways at Boadicea House, where it is to be joined by a second one next month to take over running of the reservation system from IBM 370/168s.

The two Amdahl 470s at the British Airways West London computer centre went in ahead of schedule (CW, 6 5).

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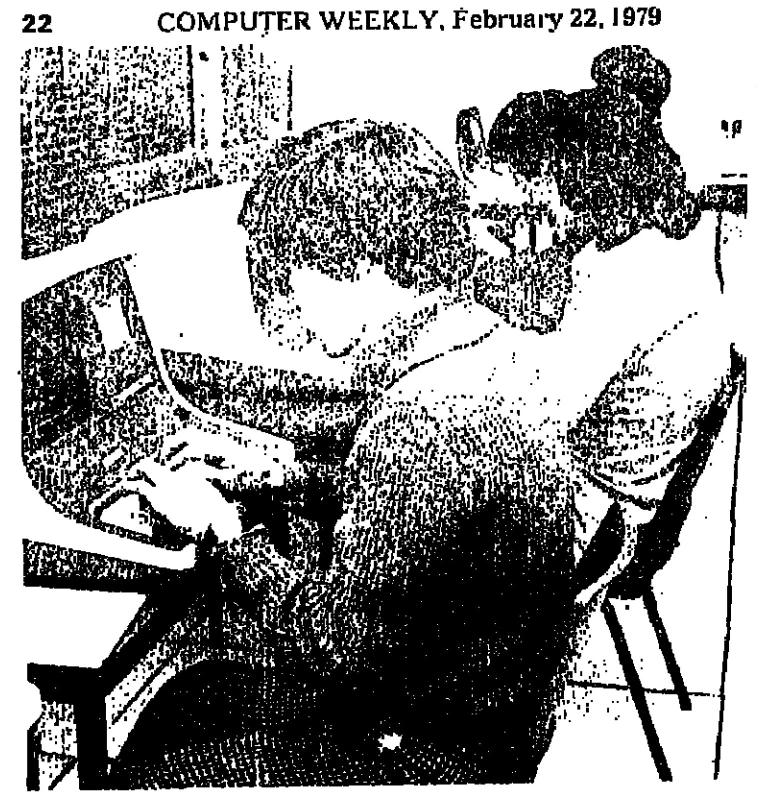

Teesside buys 45 TDS VDUs

Robustness in the hands of students was the feature of the ADDS Regent 100 that led Teesside Polytechnic to buy 45 of them from TDS of Blackburn. The Poly has a new Univac 1110 and the terminals will enable it to provide a hands-on service for 2,000 students. The Computer Science Department at Teesside is one of the largest in the UK, producing 100 degree and HND students a year.

● Our picture shows Teesside students at work in the new terminal laboratories.

ICL journal takes in-depth view of technology

THOSE who want to go into computer technology in a little more depth than is usual in the weekly and monthly computer press will welcome a new publication from ICL.

Called ICL Technical Journal*, it is to be published twice a year, and the first issue, dated November 1978, includes some stimulating articles likely to encourage readers to delve into the comprehensive bibliography provided.

Gordon Scarrott, ICL's manager of research and advanced development, discusses ICL's four most important development projects in a paper based on his address to ICL users last spring (CW, May 11 1978).

Two of the projects, the Content-addressable file store, CAFS, and the Distributed Array Processor, DAP, have been fairly widely discussed, but the article provides welcome additional information on the principles involved and the basic design. The other two projects, the Variable Computer System, VCS, and the work ICL is doing on voice output and input, are much less well-known.

The VCS is a computer system designed to simplify the problem of keeping track of the organisational structure of a user's data, by enabling him to create and to update continuously a reference map which shows both the organisation structure of his data and its mapping on to physical storage.

It is also designed to be a "soft machine," adaptable on demand to the high level language in which the source program is written.

The claims made for a VCS machine implemented on the Micos 1 processor used in the 2903 are dramatic; compared with a traditional 1900 or 2903 of the same power using the same Cobol programs, the VCS would offer a 6:1 reduction in the size of the Cobol compiler, up to ... reduction in the size of the C... object code, and 80% fa... execution of Cobol programs. ... addition the working store ... job would be reduced by ... sharing and by automatic ... justment to the working set.

According to Scarrott, ICL already has a speech synthesiser, and is thinking in terms of marrying it to the Cafs in applications like directory inquiries.

*ICL Technical Journal, published by ICL twice a year. Peter Peregrinus Ltd, PO Box 8, Southgate House, Stevenage, SG1 1HQ. Annual subscription £5.

Documation will build world's fastest impact line printers at new Irish plant

THE fastest impact line printers in the world are to be built in Ireland for the European market as part of Documation's ambitious expansion plans.

The Melbourne, Florida-based company closed its books at the end of last month and will report turnover for the year of about $55 million, up from $31 million last year. The new Irish plant will help founder and president Ray Halbert to his target of $103 million in the financial year just started.

"We currently do 25 per cent of our business in Europe, and want to get it up to 50 per cent," he said. "We plan to manufacture our full Impact line of band printers, from the Impact 1000 to the 3,000 lpm Impact 3000 in Ireland. Our present US output is 25 printers a week, and we hope that the Dublin plant will match that within a year."

HALBERT . . . ambitious plans.

Halbert has ambitious plans to source almost everything used in the printers from within Ireland.

"We have already identified potential suppliers for all the mechanical parts except for four large castings, and we hope that we will also be able to source semiconductor components for the electronic assemblies from US companies establishing plants in Europe," he said.

Documation also plans to take advantage of the Irish Industrial Development Authority's grant programme for research and development, under which the IDA will fund up to 50 per cent of the personnel grants and up to 35 per cent of the capital equipment costs of a company's R&D effort.

"We aim to invest 10 per cent of our net sales figure in R&D, and Dublin will have its full share of this in proportion to sales out of the Irish factory," said Halbert.

Documation's rapid growth makes it a prime takeover candidate, and Halbert confirms this.

"Documation is still closely held by several major shareholders who don't want to sell, and we have no intention of being taken over.

"We get regular offers, but they tend to be brutal — like 'Let's get married.' I like to make friends first."

NEWS IN BRIEF

Walkout ends at Vickers

A THREAT to its payroll, ... production control applic... from 10 computer staff ... Vickers Engineering's S... Marston works has b... removed following an impr... productivity scheme bonu... by the company.

The staff walked out in ... January as they felt Vickers ... not given a firm ex... guarantee on the payment ... bonuses. Work has r... resumed as normal.

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DIEBOLD, the leading U... plier of automatic ... machines, has renewed its ... tract with De La Rue Cr... under which the Portsc... based banking equip... manufacturer supplies D... with cash dispensing mec... isms.

Takeover

COMPUTER Associates ... known for its IBM-comp... system software such as ... Sort, has acquired Carus F... Pty, of Sydney, Australia. Th... third Carus group comp... be bought by CA.

Graphics with AOS

USERS of Data General ... puters running under Adv... Operating System, AOS ... now offered a hardw... software interface packa... Calcomp that enables c... use Calcomp's 5000 Se... plotter/printers for high... graphics output. The ... enables the user to ... parameters like the ne... plot copies required ... buffer size needed to ... plotting throughput.

Mini for software

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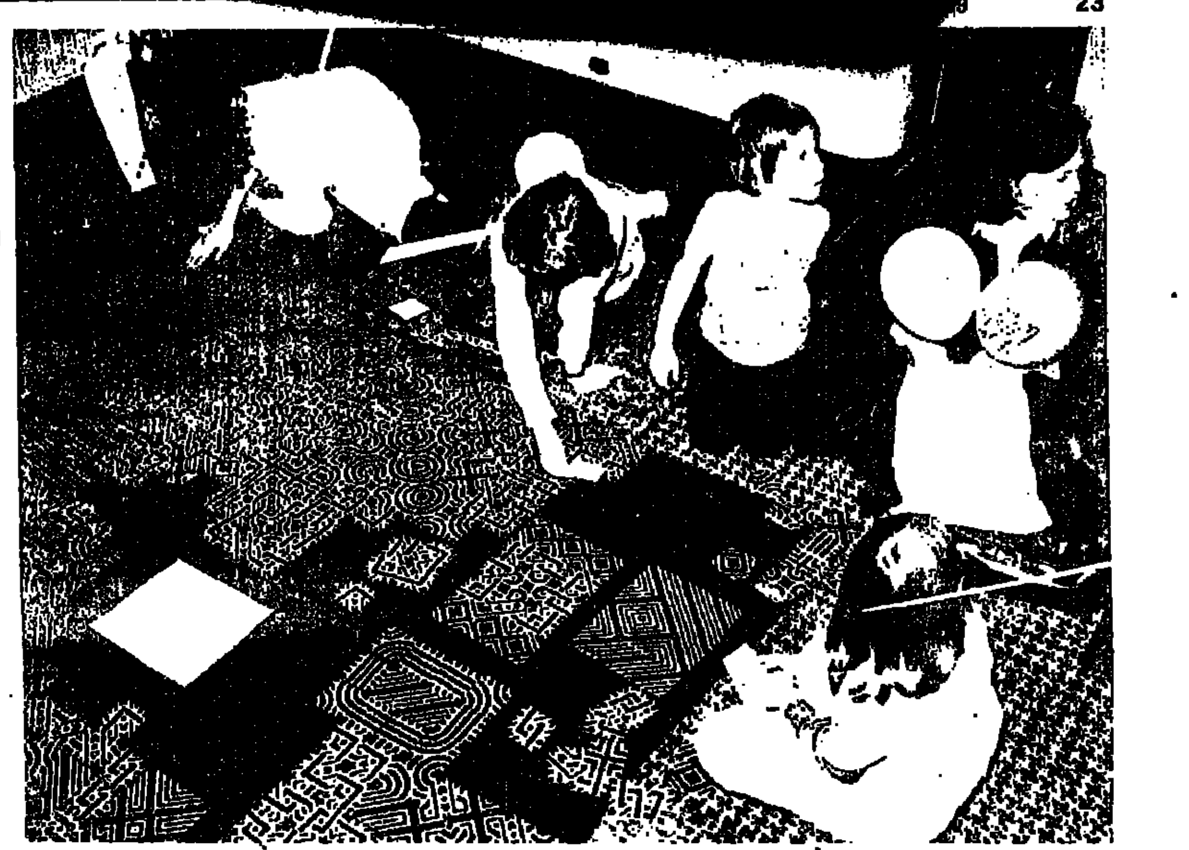
Computers, to arts people, used to be scarcely approachable gods, says the author, BRIAN SMITH, who works, teaches and researches in the area of art and technology. Few computer people cared to communicate the fact that computers really need have nothing to do with numbers.

But he points out that when you turn up in a smoke-filled studio with a small box that plugs into a TV and a tape recorder, and are quickly able to get students writing non-trivial programs, then a lot of the mystery goes.



Paul Brown's tile piece — art removed from the computer. See panel below.

'No-one raises an eyebrow at artists using computers these days'

AMAZINGLY, art done by, with or in spite of computers, has been around for nearly 30 years. The earliest visual and musical experiments were performed on analogue machines born of necessity out of the Second World War.

Now, after a period when "computer art" has been linked with larger machines and corporations, we are approaching a time which must in some ways correspond to those early days: things are getting smaller, more homespun again.

Not that there are many artists sitting around knitting their own computers — they are more likely to have bought them ready-made, or to have access to one at the art college where they work.

The Computer Arts Society, CAS, set up about ten years ago at a meeting in the London School of Hygiene and Tropical Medicine, seems to have changed in character along with this trend. Originally more concerned with organising and showing work, and regularly publishing its bulletin, Page, CAS is seen by George Mallen, one of its founder members, as now having more of an informative role. The CAS was, however, responsible for an exhibition at the recent BCS '79 fair (see panel right).

Mallen is in fact one of the people about whom pivot several strands of the "computers and arts" story. He is managing director of Systems Simulation, wherein can be found John Lansdown and Alan Sutcliffe, both original members of CAS. Lansdown is an architect; Sutcliffe is associated with Electronic Music Studios, they of the weird and wonderful synthesisers.

The plot thickens.

Work at Systems Simulation ranges from projects for the Science Research Council to animation for a couple of forthcoming science fiction films. Given all this and similar activity, Mallen thinks that CAS has done what it set out to do — "no-one raises an eyebrow at artists using computers these days."

He is also deputy head of the Department of Design Research, DDR, at the Royal College of Art — itself no pushover when it comes to computers in art and design.

Using an Altair disc-based micro system, DDR is running a computing course which is attracting not only painters, sculptors, designers, ceramicists and researchers from the RCA, but also people from other universities and colleges. Topics range from tutorials on using basic computer graphics and animation, to more general debate on the use of advanced computer methods, artificial intelligence and colour graphics in art and design, and the social implications of this sort of work.

One of the main effects on the art world of the "small is beautiful" trend in computing is, of course, the relative ease of buying a machine. The RCA's Altair has taken over from a rather older, larger machine; and there was a time when one or two small cellars housed a clanking choir of teletypes, linked to computers at home and abroad — anywhere someone had happened to donate a little timesharing or a free account.

Several "ordinary" art colleges — the RCA is, in fact, a post-graduate university — have or are obtaining computer systems, now that these have, as one lecturer put it, "broken the second-hand minivan price barrier". The present writer actually trundles a microcomputer, a Research Machines 380Z, around to art colleges in London and Canterbury, pulling it through the slush on an adapted luggage trolley with no ill-effects.

Students of painting and graphics are keen innovators of bizarre visual and conceptual programs, and it is this new, easy access which is surely at the root of changes in computer art.

Computers, to arts people, used to be the scarcely approachable gods, the omnipotent missile launchers, bank balancers, robot drivers, number crunchers and spiral drawers. Few computer people cared to communicate the fact that computers really need have nothing to do with numbers: that they might, had it not been for historical accident, have emerged (say in the late 1960s) as visually oriented devices *primarily*.

But when you turn up in a smoke-filled studio with a small box that plugs into a TV and a tape recorder, and are quickly able to get students writing non-trivial programs, then a lot of the mystification drops away.

A student of graphic design at one college has already written a finely illustrated and designed thesis on the use of computers in visual communications which stands comparison with what little there is in the book shops.

Painters have produced slowly-changing graphics which are interactive, soft, sensuous, leisurely and unlike almost all the "conventional" output which is conditioned by a more commercial context.

When, in a few years' time, there exist pocket computers capable of dealing with colour images, words and sounds, it will be as well that there are a few people around who will not be seduced by the sort of trivia that now characterise most arts-oriented computer applications.

It will be of great benefit to us all if institutions such as CAS and the Royal College's DDR can promote an aware, informed use of the increasingly powerful computer tools available to the general public. The narcotic boredom and irrelevance of landing one's 187th lunar module on a simulated moon, or of possessing a watch that will check your pulse and, if you use two hands, tell the time in Indonesia, will hopefully not be found in the fresh, by definition unpredictable, things that are going to happen in the arts — with the help of computers, accessibility and . . . what? A couple of years?

Art in the raw — at least it was kinetic. A computer-choreographed custard pie fight.

MANIPULATION MASQUERADING AS ART . . . .

"SOFTWARE portability" was definitively demonstrated at the recent BCS '79 Young Computing Fun Fair when some floppy discs were "stolen" from a computer art exhibit. Though cunningly hidden behind the floppy disc unit, the platters were liberated by hands small enough to penetrate the gap between machine and wall.

None of the artworks was stolen, however. *It* is the purpose of this review to suggest that, with some important exceptions, this fate would not have been a bad thing. The Computer Arts Society organised a show consisting mainly of prints produced using computers. There was a feeling of deja vu about many of them. Here, again, were the curves and spirals, the randomised patterns and the distortions: exercises in manipulation, masquerading as art.

It is true, of course, that for most of the young visitors — and there were many — this was the first experience of computer arts. But the inherent tedium of much of the work meant that spectators were massed around the two or three worthwhile pieces on show.

Before mentioning these and going on to suggest that the real art lay outside this show, in the main concourse downstairs, it is as well to explain further why I think that the rest of the work was so uninspiring. It is, as noted elsewhere on this page, one function of CAS to collect and to disseminate information. This is a most important role. CAS is a valid institution and even I lashed out £2 to join it, in the midst of that show.

But like some ageing ravisher, it will keep exposing that which has grown small and less than stimulating, and was never up to much anyway.

Like shining laser beams down Oxford Street, blinding the pigeons and inducing mass apathy in those who had seen them for more than a minute, the soul of so much computer art has been — still is — pure gimmickry, a Victorian hangover — exhibiting bits of technology as if they were art.

It is mystificatory, self-congratulatory twaddle, expecting the reaction "WOW!", followed by nothing much at all. The ever-jammed slide projectors in the Science Museum's computing gallery perform, when capable, to a fraction of the spectators and participants crowding round the terminal a few yards away, which guesses what animal you have in mind, or tells you how to get from one tube station to another.

Is this to be expected? Is "art", after all, destined to be dull, not even as interesting as these silly games that all the kids see through and thus rapidly abuse? If you look at the majority of computer graphics exhibited as artworks — yes.

There were, as I said, exceptions. By and large they involved doing things, not just looking. As well as interactive colour graphics and animated film, which at *least* moved, there was at the CAS show the work of Paul Brown. While his graphics, framed on the wall, are susceptible to the criticisms above, he has had the sense to take his ideas out of the computer, make them bigger, cut them up and spread them around on the floor.

He uses 82 different modules, black and white lines and curves which can be fitted together randomly or according to rules. It might be argued that the clusters of children and adults crouched for long periods over their growing patterns need never have heard of a computer; that people were doing similar things before computers came along.

True; but so what? If we are to say that something is not so worthwhile because it doesn't need a computer any more, then we could call ourselves "computer freaks" or "salesmen" but not artists.

Downstairs, there were little booths sheltering groups of honest gents from such as the Newcastle University Computer-Controlled Model Railway, with their Brief Technical Description; the Natural Language people and the Computer Education group. The nodding and smiling policemen with their terminal link to 1984, and Joanna Lumley giving the performance of a lifetime as a smiling stranger all confirmed one's suspicions.

Here was the art. This is what we should be exhibiting, and-lysing, juxtaposing and slyly using. To make and to see "art", we should be looking outside the magic box at the witches, their apprentices and bemused familiars.

Intelligence, flexibility and ease of use and storage are some of the advantages of the key-to-cassette method in the growing data entry market, says Richard Wightman, product line manager for intelligent data entry products with Kode Ltd. He has over five years' experience in the data entry market and has been associated with both the marketing and support of the DataVet system.

Benefits of cassettes in distributed data entry

The DataVet installation at Makro's Manchester store.

By Richard Wightman

DISTRIBUTED data entry is not new; it's been around almost as long as data processing itself. Companies with many factories or branches commonly distribute data entry to a local data preparation room at each site before bringing the data together at the central mainframe for processing.

Smaller companies also operate in a distributed data entry environment, often with only one or two paper tape punches or card punches to prepare the data which they subsequently send to a bureau or to a parent company for processing.

What is new are the growing demands for more distribution of the data entry process to the user sites and the availability of suitable equipment for this. As you distribute the data entry process so you move from a large central data preparation room to several scattered sites, each with only a few keystations. Where the data entry process consists of a real time file inquiry and update, then a solution embodying online visual displays must be chosen. However, most data entry is represented by the bulk keying of serial data for batch processing. It is this area we shall look at in more detail, and at the reasons why key-to-cassette is an ideal solution.

Distributed data entry sites are small and at the extreme are single keystation sites. Thus, in terms of the keystation hardware, the required equipment must be based on standalone independent keystations. This offers unique flexibility in installation and later relocation if necessary.

A more recent requirement is that the data entry keystation must have intelligence to meet the changing needs of the user. Where the keystation is replacing a keypunch the user wants data validity checks, eg. alpha, numeric, batch totals, etc, to speed keying and reduce errors reaching the computer.

Where the keystation is going into the "clerk entry" environment, where computing equipment has not previously been used, then ease of use is more important.

A typical terminal could consist of keyboard, visual display unit and twin cassette drives, provided together in an office-desk styled unit.

For bulk data entry the cassette is the ideal medium for recording and storing data at the operating site. The traditional media, cards or paper tape, are now becoming more expensive while producing a very bulky and heavy output.

A cassette is a tangible output medium but is compact, lightweight and re-usable. The same applies to the flexible disc, but this suffers from the disadvantage that it must be treated more carefully. Floppy discs must always be kept flat and operators must avoid touching exposed parts of the disc surface.

Operators are used to handling audio cassettes and will readily move to equipment using a familiar medium. The inherent ruggedness of cassettes ensures the integrity of data, especially in environments not used to the handling of computer media. Cassettes dropped on to the floor will suffer no damage, and they may safely be sent through the post without damage or loss of data.

Cassettes contain 86 metres of computer grade magnetic tape and have a capacity of around 3,000 80-column records of data if recorded on both sides. A major advantage of cassette recording over floppy discs is that the recording method is standardised to an international specification (ECMA 34-Edition July 2, 1973) allowing interchange between different equipments and computers. A key-cassette terminal may thus be used to prepare input to many different computers directly from the first keying operation.

Several of the small, to medium size mainframes, for example from NCR or Honeywell, have cassette readers which can accept batch input from cassette, while cassette input to many ICL mainframes may be achieved through the cassette reader of an ICL 7503 remote job entry terminal.

Provided that the data format of the cassette is of the required structure, in terms of labelling; character set; block length; control characters, etc, then cassettes prepared on a key-cassette terminal can be input directly for processing.

The same applies to small business/accounting computers, many of which have cassette input/output. Here the key-cassette terminal is essential for offline data preparation when the volume of data entry exceeds the capacity of the single keyboard of most of these machines.

Key-to-cassette thus has a very wide compatibility for preparing computer input for direct input from cassette. In applications where cassette compatibility is not required, then the benefits of using cassettes may still be realised but now computer input is achieved either by pooling cassettes on to compatible half-inch magnetic tape or by using communications to send data from cassette directly to the computer.

Local authorities are an example of a distributed data entry organisation; with data preparation at district council level, input is generally fed to the mainframe computer at county level. In Cornwall, the district councils are linked to an ICL 1904S in County Hall at Truro via ICL 7503 terminals.

In the districts, experienced keypunch operators are now using 21 Kode DataVet keystations, located throughout the county, to prepare clean data on to cassettes which are then transmitted, from the cassette reader on their 7503 terminal, to Truro.

Originally Kode paper tape keypunches were used but the steady growth in the volume of data entry has meant a change to more modern equipment having a much greater capacity per operator. At Carrick District Council, the use of DataVet keystations has virtually eliminated keying errors and has allowed the achievement of around 40% savings in the time taken to perform one of its major keying jobs.

Even more widely distributed are the operations of Ipswich Computer Services Limited. A computer bureau specialising in the needs of motor dealers, ICS operates a number of systems for garage stock control and management accounting on its computer at Woodbridge in Suffolk. As part of an integrated service, DataVet key-cassette terminals are used widely by ICS customers located throughout the country from Canterbury to Glasgow.

The users are normally typists with little or no knowledge of computers and previously spent a large [illegible] of time writing out information to send to ICS, who punched this on to paper. Now with a key-cassette terminal they are responsible for their own data preparation.

The system [illegible] efficiently, with ICS [illegible] training in both key[illegible] operation and in the [illegible] applications used. Coupled [illegible] simplicity of operation [illegible] allowed even inexpe[rienced] operators to achieve [illegible] results within a few day[s].

Data is keyed on to [illegible] using formats supplied [illegible] and the cassettes are [illegible] Datapost to Woodbridge [illegible] they are pooled to half [illegible] magnetic tape for input [illegible] Honeywell mainframe. The [illegible] of cassettes, coupled with [illegible] intelligence of the keys[tations] has allowed a fairly pain[less in]troduction of computer[s] into an office and has re[lieved] ICS of the problems of data preparation while providing [the] user with a simple means [of en]suring accurate input information.

A logical extension of [illegible] the Datapost service to [illegible] cassette data from one [part of] the country to another is [illegible] data communications.

A London company is [illegible] DataVet key-cassette term[inals] in a distributed operation [illegible] will combine the benefits of the cassette medium and [data] communications. At the [illegible] site, data is prepared on [cass]ette under the control of [a for]mat program which per[forms] validity checks to ensure accuracy of the keyed [data]. Cassettes will then be [transmit]ted over dial-up PO lines [to a] similar DataVet at the [illegible] office where the data [is] received on to cassette [illegible] cassettes are then read [illegible] mainframe cassette read[er for] processing.

The mainframe may [illegible] put print files, e.g. [illegible] reports, invoices etc, [illegible] ette. Additional benefits [illegible] then occur by transmitting [illegible] cassette from the [illegible] DataVet terminal back to [the] user.

The applications [illegible] typical of the use of batch [illegible] ette terminals for distrib[uted] entry, but many other [illegible] applications are in operation [illegible] both industry and com[merce]. The ease of use of cas[settes] their robust construction [illegible] the compatibility of [illegible] recording terminals with [illegible] mainframe and business [com]puters, has made [illegible] cassette keystation [illegible] equipment for distributed [data] entry.

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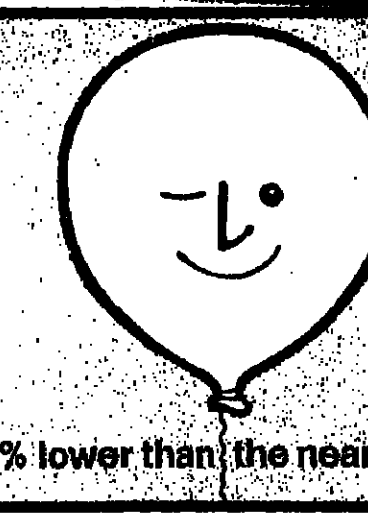

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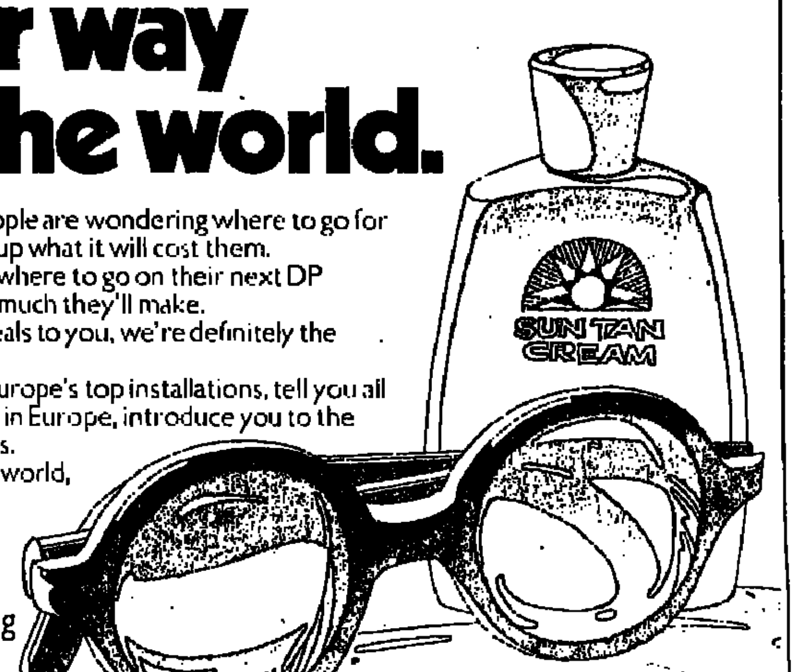

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COBOL Programmer/Snr. Prog. Salary negotiable above **£5,000** Systems Programmer with 2-3 yrs. PLAN exp. if poss. **c£6,000**

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Our Client, based in Feltham in Middlesex, is currently recruiting both Cobol programming people and project leaders with 2-4 years experience in the Banking and Datacommunications fields. Hardware consists of a variety of Burroughs equipment, but experience of other mainframes and minis would also be welcome.

For more information phone Andy Mogg.

Operations

IBM 370/138/148 DOS/VS

An International bank in the City is seeking an Operator. The suitable candidate should have a minimum of 2 years IBM 370 DOS/VS experience, preferably with POWER. The shift pattern is at present, at 21 hour coverage, changing soon to 24 hours. Usual banking perks apply i.e. 3% mortgage facility, annual bonus of up to 15% of salary, non-contributory pension scheme, medical and life assurance plans. Also offered are subsidised meals and travel.

SALARY £4,500 incl.

ICL 2903 EXEC I

A Computer Service Bureau in W.1 are looking for an Operations Supervisor to run a 2903 installation. Experience required would be a minimum of 3 years operating 1900 range, or preferably 2903. This is a day time post — hours 8.30 a.m. to 6 p.m. with good opportunities to get into the programming field in the future. Help to find accommodation may be provided by the Company.

SALARY £4,500

HONEYWELL 58/PDP11/70

A Company manufacturing laboratory equipment, situated in Croydon, Surrey, are in need of an Operations Controller. At present, they have a Honeywell 58 but are in the process of changing to a PDP 11/70, so the ideal applicant should have Honeywell operating experience and preferably a knowledge of PDP's. The Company benefits include: 4 weeks holidays, a staff pension scheme and staff canteen. The hours are 8.45 a.m. — 5 p.m.

SALARY £5,000 neg.

IBM system 3 & System 32

A Computer Service Bureau in the City are looking for an experienced Data Control Clerk to work a 12 hour day, 3 times a week. The suitable candidate would be over 25, good at figures and used to dealing with client queries and problems. Benefits include 3 weeks holidays a year, 15p L.V.'s a day and subsidised canteen.

SALARY £4,000 + neg. a.a.e.

For more information phone Elaine Collis or Sally Oliver.

All vacancies are open to both male and female applicants. Phone Andy Mogg anytime, or for an application form leave your name and address with our answering service.

01-491 4706 24 HOUR ANSWER PHONE

OR WHEN BUSY 01-439 3411
ALTERNATIVELY PHONE ANDY MOGG AT HOME ON 01-998 8464

Knight

Knight Computer Services Ltd.
14 Old Park Lane, London W1Y 4NL

Staff Services Division of BOC Datasolve Group and a member of Computing Services Association

MYRIAD

SALES SUCCESS

A dynamic salesforce, an unrivalled product range, and first-class technical and administrative sales support are three prime factors in the success of any manufacturing organisation. Our client is the undisputed market leader in the data communications field. The ever increasing demand for their products, and their determination to capitalise upon the tremendous potential of the expanding communications market, has created a number of outstanding opportunities for both experienced sales executives, in territories throughout the South of England, and trainees, to join their highly successful team.

The ideal **SALES EXECUTIVE** will have previous experience of selling data communications kit. However, a successful track record in any computer or electronics related field will also be relevant. A substantial basic salary is offered, plus bonus, generous commission scheme and company car. Commission will be guaranteed initially, and the first year quota earnings are circa £8000, which one may confidently expect to exceed. In an environment where sales, in real terms, have developed rapidly in recent years, the persons appointed may look forward to unlimited career opportunities.

The **SALES TRAINEES** will initially be responsible for providing support to field sales executives, producing quotations and proposals, and maintaining close links with existing clients. After a period of approximately eighteen months, however, one may look forward to a move into field sales. Based at company H.Q. in Reading these positions carry a commencing salary circa £4500. They are excellent opportunities for young persons with electronics or micro-processor experience, or relevant academic achievements, for example, 'A' Level/ONC Physics, who have the necessary flair and enthusiasm to succeed in a demanding commercial environment.

With the increasing trend toward distributed processing and satellite computing facilities, data communications is now one of the foremost growth areas within the D.P. industry. The persons appointed to these positions will join one of the most successful organisations in the U.K. and can look forward to a dynamic and challenging future.

Ref: SW1/2202

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 24 HRS.

Applications software support staff

The company

Honeywell Information Systems is one of the largest suppliers of computing systems in the world offering the full breadth of equipment from the small but powerful Level 6 mini to the mighty Level 66 and Level 68, renowned for their ability to provide reliability in complex multi-access situations (and a wide range of computers for all occasions in between). We aim to stay ahead of the competition.

The job

You will be working in a small but rapidly expanding central support unit providing concentrated expertise on all applications packages supplied by the company. You will find this a stimulating environment in which to work in the certain knowledge that the demand for applications packages is growing faster than any other section of the industry. Life will not be easy but it will be rewarding.

Location

The Support group will be located in a modern building in Slough along with a number of other groups of staff to whom easy access is necessary. There are other opportunities elsewhere.

You

Will have at least five years' experience of programming in high level languages and will have been directly involved in financial management, distribution, manufacturing or management sciences.

If you have less experience than is specified or wish to live in another part of the country there are other opportunities within the company and we would still like to hear from you.

Salaries

Salaries range from £6,000 upward, dependent upon experience, plus attractive fringe benefits.

Prospects

If you are the right man or woman for the job you will have potential to grow in ever more rewarding directions and the prospects for doing this within Honeywell are excellent.

To apply

If you are interested then write in confidence to: Garrick Fraser, Personnel Manager, Honeywell Information Systems Ltd., Honeywell House, Great West Road, Brentford, Middlesex, or telephone him on 01-568 9191.

Honeywell

MYRIAD

SENIOR PROGRAMMER
&
ANALYST PROGRAMMERS

EUSTON BASED

University Computing Centre, UCC (GB) Ltd., is the British arm of a major European Computer Bureau offering a full and comprehensive service based on a network of Univac mainframes linked to service centres and clients in the U.K. and Europe.

The company offer a range of services to both the engineering and commercial sectors involving RBT, interactive terminals access, and a "walk-in" processing facility.

The London Data Centre, in Euston, has dual Univac 1108 computers with two more being installed and serves not only U.K. clients but also, via private lines, offices in the Hague, Frankfurt and Paris.

UCC (GB) Ltd. provide a service to a wide range of industries. Application programs are supported by two major divisions; the Technical Application Division with software to deal with civil electronic, structural and chemical engineering applications and the Commercial Application Division with software for financial, manufacturing, mailing and database applications.

The Systems and Programming Department of the Euston Service Centre is currently seeking additional personnel.

SENIOR PROGRAMMER — **To £6500**

A Senior Programmer, keen to gain both increased project responsibility together with indepth technical involvement in system design is required to head up a team of programmers. The successful applicant will have a sound knowledge of COBOL together with experience of commercial applications systems. Ideally you will be keen to meet users and be happy to function in a client orientated environment.

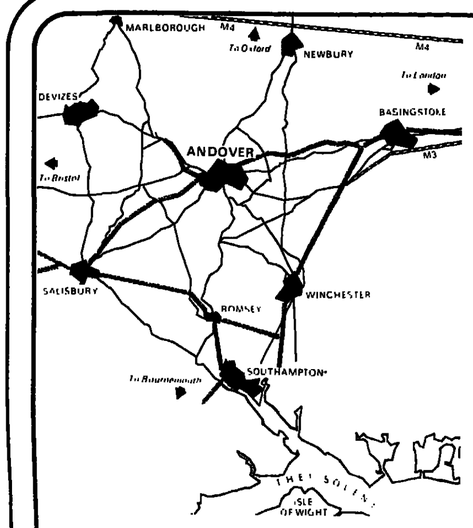
ANALYST/PROGRAMMERS

Two additional Analyst/Programmers will be expected to gain an indepth appreciation of UCC products and will analyse and implement client requirements. Applicants will ideally have experience of design and program specification and be keen to develop analysis skills as a member of a professional service organisation.

Both positions offer excellent scope for advancement together with the opportunity to work on a variety of projects for Companies with a broad range of business interests.

Ref. E1/2202

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 24 HRS.



For further information, please contact:
Mike Creamer

JAMES BAKER ASSOCIATES
International Personnel Consultants
16 Maddox Street, London W1
Tel: 01-491 4478

JBA

TSB
Trust Company Limited

THE COMPANY

A large and expanding Life Insurance and Unit Trust company, part of the TSB group, committed to using sophisticated systems as the prime tool for operating and managing the company.
The purpose built head-office at Andover (surrounded by lovely Hampshire countryside) has a Burroughs B6800 machine – recently upgraded from B3800 – and development of integrated insurance systems is well underway. The database system being utilised is the DMS2 with real-time transaction processing on a VDU terminal network planned.
Unique development opportunities exist for computer professionals to become involved in advanced systems.

THE BENEFITS

A stimulating career in an expanding, prestigious company, where individuals matter, particularly in terms of career objectives and personal achievement. The following features are part of the employment package which substantially increase gross salary figures:

- A competitive salary on a rising scale;
- Mortgage subsidy;
- Non-contributory pension scheme;
- Free Life Insurance and permanent health scheme;
- Generous relocation expenses.

PROGRAMMERS
up to £5,000+benefits

At least 18 months COBOL programming experience is required, ideally gained on systems incorporating real-time terminals and, preferably, a database. A background on Burroughs equipment will be an added bonus.
Programmers who are appointed will receive training and the opportunity to diversify experience on a variety of applications as their career develops.

SENIOR PROGRAMMERS
up to £6,300+benefits

Candidates for these positions will have a number of years experience of programming on real-time terminal systems in COBOL. Particular experience on insurance, banking or financial applications will ensure serious consideration as will a knowledge of Burroughs equipment.
Successful candidates will assume a high degree of responsibility, after any initial training, and opportunities will exist for wide diversification. A knowledge of ALGOL will be useful for some vacancies.

SYSTEMS ANALYSTS
up to £6,000+benefits

SENIOR SYSTEMS ANALYSTS
up to £7,200+benefits

Systems Analysts with a track-record on insurance or financial systems development will be particularly suitable. The company is dedicated towards terminal network processing with DMS2 and previous work in this type of system is very desirable. A programming background is not essential but deemed necessary for some of the vacancies.
Successful applicants will assume project responsibility within a short time, depending on the personal ability and skill of the individual.

European Marketing-Computer Services

Our client, a leading international computer services company, now wish to expand their European Marketing Operation by recruiting three key personnel for new posts based in South-West London.

MARKETING REQUIREMENTS SPECIALISTS
MARKET ANALYSIS AND PLANNING
ADVERTISING SALES AND PROMOTION

The Marketing/Planning Operation consists of a group of specialists who act as consultants in Strategic and Operating Planning — marketing analysis — co-ordination of European product launches — research and evaluation — generation of European advertising and sales promotion — all of which is done by placing emphasis on input received from individual European countries.

As this is a key department in the European organisation, it is envisaged that the marketing candidates will come from either a strict marketing discipline within a general business environment or have several years' experience in product planning/marketing in computer services; while the emphasis for the third position will be on candidates with media P.R. experience preferably within the Data Processing industry.

A percentage of time will be spent in Europe, so the ability to communicate with top management and to influence strategy is important.

Substantial remuneration packages will be paid which reflect the importance placed upon these positions including the usual benefits associated with an international corporation.

TO ARRANGE A CONFIDENTIAL DISCUSSION PLEASE TELEPHONE OR WRITE:

TONY FIDLER, DATA SEARCH
53 VICTORIA STREET
LONDON SW1. 01-222 2022

a member of the Search group

Data Search

Ports Industry Data Processing Management

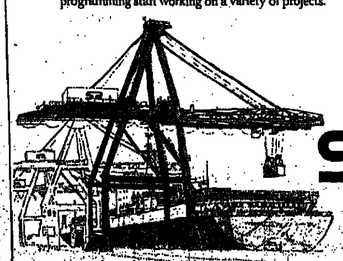
British Transport Docks Board is a commercial and profitable organisation employing 12,000 staff at various locations throughout the U.K. The Board's Computer Centre, located at Hayes, West London, provides development and operational computer services for the Board's 19 ports and for other port industry organisations. The Centre has recently completed a major review of the ports' computing requirements. To satisfy these requirements, minicomputers with visual displays and communication facilities have already been installed at some of the ports and it is anticipated that the Board's mainframe computer will shortly be replaced with a more powerful machine with extensive on-line capabilities. In order to support these developments the Board now requires the following senior management staff:

Systems Manager

Up to £7,364 per annum
(including London Allowance)
Will be responsible for advising the Board's management on the use of computers and for managing all aspects of the development work undertaken by a team of up to eight systems and programming staff working on a variety of projects.

Chief Programmer

Up to £6,537 per annum
(including London Allowance)
Will be responsible for the technical management of the programming function, advising the Board's management on computer software. Duties will include controlling all aspects of the Board's programming standards and optimising program design, development and maintenance work.
The Computer Centre is easily accessible from the M4 motorway and the Western Region British Rail (Hayes and Harlington Station). Conditions of service include 32 days' (including statutory days) holiday per annum, sick pay scheme, pension scheme and luncheon vouchers (60p per day).
Applicants are invited to write to the **Personnel Department, British Transport Docks Board, Melbury House, Melbury Terrace, London NW1 6JY** or telephone **Jim Harraway on 01-486 6621 extension 6441.**



British Transport Docks Board

SYSTEMS DESIGNERS LIMITED

Quality first

Opportunities for Software Professionals in Mini and Micro Systems

SALARIES TO £10,500

Informal interviews at our Head Office in Camberley from 17.30 — 21.00 hours on Tuesday, February 27.

SDL is a professional organisation with total system and software capability. To help meet the continuing high demands placed on our services, a considerable number of professionals are needed at Consultant, Engineer and Programmer levels.

We are holding informal interviews in our offices in Pembroke Broadway, Camberley on February 27 from 17.30 to 21.00 hours and we will be pleased to welcome anyone interested in learning more about our company and the rewarding careers offered.

If you can meet the challenge of intellectually stimulating and varied work with a leading well-established software and systems consultancy, specialising in mini and micro computer real-time applications, then please drop in for a drink and a chat with our managers and consultants. The office is adjacent to Camberley BR station.

Systems Designers staff benefit from a wide variety of experience both of project applications and of computer systems.

The company offers productivity bonus, insurance and pension schemes and assists with relocation if required.

Our principle work areas are currently –

Communications
Message switching, Telex systems, communications management systems and computer communications

Industrial
Process control and monitoring, plant control simulation, high speed data analysis and distributed microprocessor systems

Military
Modelling, avionics and Radar systems, complex rigs, simulators and microprocessor missile systems

Software Products
Compiler technology, software design techniques, MASCOT and information processing systems, STATUS and VIEWDATA systems.

Consultancy
Complex military systems, software and systems development technology.

Systems Designers staff benefit from a wide variety of experience both of project applications and of computer systems.
Starting salary is negotiable up to £10,500 pa according to ability and experience.
The company offers productivity bonus, insurance and pension schemes and assists with relocation if required.

If you cannot make it to these informal interviews, telephone Bill Hockey, our Operations Director, on Camberley (0276) 62244, or write to him at:

Systems Designers Limited
Systems House
1 Pembroke Broadway
Camberley, Surrey GU15 3 XH

MYRIAD

RPG II + CCP = (£5K-£7K) + BONUS

TWO PROGRAMMERS

SURREY

Applicants for these positions will have gained a strong knowledge of RPG II (3 yrs. +) on IBM equipment and have a good understanding of CCP. A background in commercial systems will be an advantage but full training will be given in O & M, D.P. and business procedures.

The data processing department is engaged on a variety of development projects (most of which use on-line techniques) and has expansion plans that continue well into the next decade. A System 38 is on order to replace the System 3 currently installed, so persons joining the company now can be assured of an interesting and rewarding future.

In addition to a pension scheme, four weeks' holiday, BUPA and L.V.s, employee benefits include an annual bonus in the region of 10%. The offices are easily accessible by road or rail from most parts of Surrey and relocation expenses are paid where applicable.

S1/2202

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants
Telephone or write to:- 30 Fleet Street London EC4Y 1AA 01-353 0981 (24 hrs)

BRITISH GAS — Share in the future of Britain's Gas

KEYPROCESSING SUPERVISOR

CROYDON

Starting Salary not less than £4,257 per annum.

SEGAS require a Keyprocessing Supervisor for their large computer data preparation section situated at Regional Headquarters, Croydon. The Supervisor will be responsible for the overall control and organisation of the Section comprising approximately 70 Punch Operators and associated clerical staff using CMC 12 key to disk systems.

Applicants should, preferably, have 3-4 years' previous supervisory experience in a large installation environment and a working knowledge of key-to-disk data entry systems.

- ★ Good working conditions
- ★ Generous holidays
- ★ Sick pay, pension and insurance schemes
- ★ Sports and social facilities

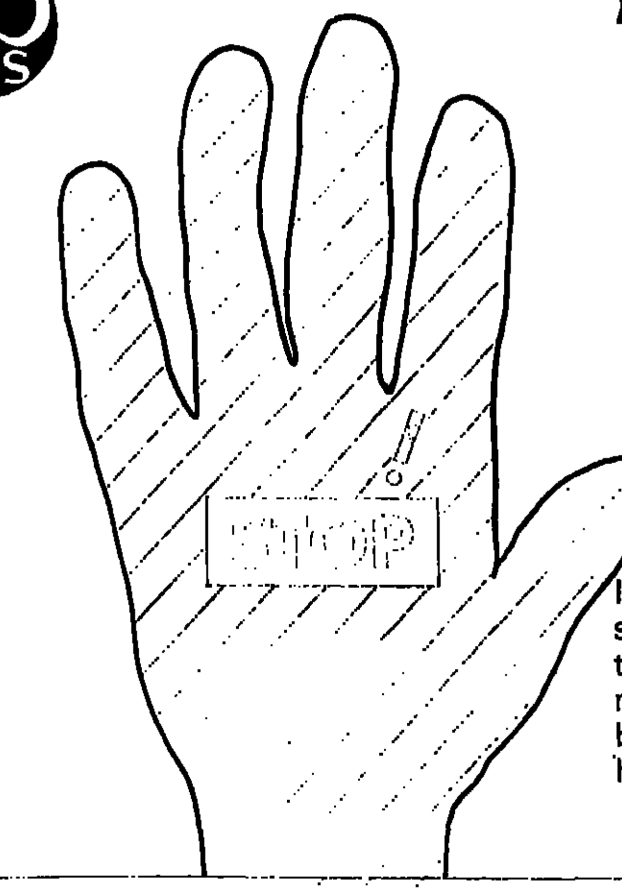
Write giving full details, within 7 days, and quoting Ref. O.4046 to:

Personnel Manager, Segas, Segas House, Katharine Street, Croydon CR9 1JU.

Under normal circumstances applicants will be informed of the outcome of their application within two weeks.

SEGAS

YOUR FUTURE IS IN YOUR HANDS



SYSTEMS ANALYSTS

(? required)

£6,500

In order to learn either IMS or 3790 systems design, all we are asking is that you have a minimum of 18 months' analysis experience. A business background would be helpful but not essential.

PROGRAMMERS

(4 required)

£5,000

All we require is a minimum 2 years' PL/1 programming experience and a knowledge of JCL. You will be trained on IMS DB/DC or 3790 programming.

LOCATION — LONDON W14
HARDWARE 370/158

For further information please contact
Mike Burton — at —
DIRECT PROGRAMMING SERVICES LTD
51 LONG LANE, WEST SMITHFIELD
LONDON EC1A 9EL.
Tel: 01-606 1738/39/30 (24 hr. service)

Our client is an independent organisation acting as a bureau to a large company group. This demanding environment includes both batch and on-line facilities. Application areas range from payroll to order processing. It cannot be emphasised too strongly that a powerful training programme is in operation as well as a clearly defined career path designed to reward effort skill and advance your technical and managerial skills. Company benefits are substantial and with a totally professional organisation.

OPERATIONS

IBM SEN OP/S LDR — £5500 +
Major International organisation located in C London requires 4 years OS exp for 370/158 installation. Short term prospects to Shift Leader (£6K +) and planned upgrade to New Range equipment.

IBM TECH SUPP — c£5200
Four years IBM 360/370 exp is a requirement for this City based commercial organisation. Applicants should be fully conversant with OS JCL & Utilities. Sub mortgage. DAYS ONLY

IBM DOS OPERATOR — £4500
A City based bank has a vacancy for an Op with 12 Months DOS VS exp to work with their IBM 370/135 on a 3-shift system. Sub mortgage

IBM OS OPERATOR — £4500
Large international banking organisation in C London requires an Op with 12 months OS exp for 370/148. Sub mortgage and high annual bonus.

ICL SENIOR OP — c£4750
Excellent opportunity for an Op with approx. 18 months Geo 2 exp. wishing to work in NW London. Mid-range ICL 1900 m/c under G2+ run on a 2-shift system. Outstanding benefits include profit — share, free meals and 5 weeks holidays.

ICL OPS — £4300 +
Essex based 1900 installation (shortly upgrading to 2900 New Range) requires Ops with 12 months + Geo 2 exp., to work on a 2-shift system.

ICL OP — £AAE
New 2903 user based in Herts. requires an Op with George or Exec exp., to join a small but expanding team. 2-shifts.

PDP OP — £4500
Leading financial concern with a dual PDP installation located in the City, is seeking an Operator. Benefits include sub mortgage, free lunches & 4 weeks holidays.

SYSTEMS & PROGRAMMING

DP SUPPORT (TRAINEE) — £4200
A knowledge of programming, a good academic background, and the ability to communicate well are prime requirements for this position. The client, a prestigious computer services group, offers you comprehensive training, opportunities for INTERNATIONAL TRAVEL and a challenging career.

COBOL PROGS (CITY) — £Neg
Our client, in finance, currently have an ICL 2904 and are recruiting programmers with 2 years or more COBOL experience. Their expansion and upgrade is planned. They offer you excellent salaries, good prospects, meal allowance and an annual bonus.

NALYST & PROGS (HERTS) — to £7000
This ICL 2903 installation requires that you have financial, stock control and retail knowledge together with COBOL experience. The senior positions will require that you assist in the selection of a new machine. The ANALYST will have the benefit of a company car.

Computer Two Thousand
217-218 Tottenham Court Road
London W1P 9AF
Telephone: 01-637 3265/6

Analyst/ Programmers

Surrey

starting to £7,500 plus benefits

Our client is a major British group of companies with a turnover around £100m and a £million investment in computer hardware consisting of a large central mainframe supporting a network of remote interactive minis and terminals. The Computer Services Division is responsible for promoting a wide range of DP systems to the group and there is scope for a significant upgrade in computing power throughout the network to cater for on-line database processing via distributed communications architecture. Interactive applications programming development is standard practice.

You possess at the minimum 4 years experience in commercial applications programming in a COBOL environment, and have some exposure in direct communication with users in related systems design. You may well also have had some exposure on database, teleprocessing, real time, or mini computing projects, and this additional experience, whilst not essential, would be useful in these appointments.

Working for our client, who will provide appropriate full training in advanced technologies, you will be given adequate freedom to conduct and control your own assignments, resolve operational problems, develop effective rapport with users in your own style, and be provided with every opportunity of developing your own particular skills and professionalism up a career path of your own choice. The client operates an enlightened career progression and remuneration policy based solely on contribution, experience and results, such that established technical competence and ability can obtain financial reward equal to that paid to management.

Excellent starting salaries are offered up to £7,500 plus benefits, and appropriate relocation expenses. Applications are invited from people of either sex possessing the relevant experience, and looking for a well paid DP career path of their own making.

TO APPLY
Please send a ONE PAGE listing, handwritten or typed, of, name, address, age, present position, salary and applications worked on, previous positions with applications worked on, hardware and software experience, number of years COBOL experience, knowledge of any other language, and length of any experience as analyst/programmer etc., to ANTHONY SPURR, Management Recruitment Division, quoting reference number G695. All applications will be dealt with promptly and in confidence. Interviews will be with the client direct. Please list on the reverse side of your application those companies with whom you would not wish to proceed.

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UT
Telephone 01-633 0866

BIS Applied Systems

University of London Computer Centre

The University of London Computer Centre provides a regional computer service to the University of London and Universities in the South East and South West of England. The Centre is equipped with Control Data 7600, 6600, 6400 and CYBER 72 computers and supports a large communications network of over 50 remote batch terminals, and 30 keyboard terminals.

An exciting development programme is planned which includes substantial replacement of the existing equipment in the early 1980's.

Applications are invited for the following posts:

Operating Systems Group

Senior Analyst/Programmer: Performance Measurement

The Centre wishes to appoint a senior analyst/programmer to develop and exploit performance measurement techniques. This is a senior position and offers substantial possibilities for making a major contribution to the development of the Centre's services. Candidates for this post should have a number of years' experience in operating systems work including experience of performance measurement. Knowledge of Control Data equipment is not essential.

Analyst/Programmer: Systems Integration

An analyst/programmer is required to work on operating systems integration and testing. Candidates should have some experience of operating systems support or machine level programming. Knowledge of Control Data Equipment is not essential.

Candidates for both posts should be educated to degree level or equivalent.

Salary will commensurate with age and experience on scales £4133-7764 (under review) plus £450 per annum London Allowance.

User Support Group

Analyst/Programmer: Compilers and Graphics

An analyst/programmer is required to work in the User Support Group with particular interest in the implementation, maintenance and support of compilers and graphics software. Candidates for the post preferably should be graduates or postgraduates with a high level of fluency in FORTRAN. Experience of Control Data Equipment is not essential.

Salary will be commensurate with age and experience on scales £3384-£6555 (under review) plus £450 per annum London Allowance.

The Centre offers excellent conditions of service and operates the Universities Superannuation Scheme. Further details and application forms are available from the Assistant Secretary, ULCC, 20 Guildford Street, London WC1N 1DZ. Telephone: 01-405 8400.

Applications close 16th March, 1979.

DESOUTTER

Manufacturer of pneumatic power tools

HONEYWELL 64/50

We require a COMPUTER OPERATOR with a minimum of 12 months' experience of GCOS 2000 or 64 native mode operating system.

The successful applicant would join a small team of operators working a 2 SHIFT SYSTEM (8.00 a.m.-4.30 p.m.; 4.00 p.m.-Midnight).

Please write with brief details or ring 01-205 7050 for an application form.

Personnel Department, Desoutter Limited
319 Edgware Road, Colindale, London NW9

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring David Abbey for further details on 01-261 8016.

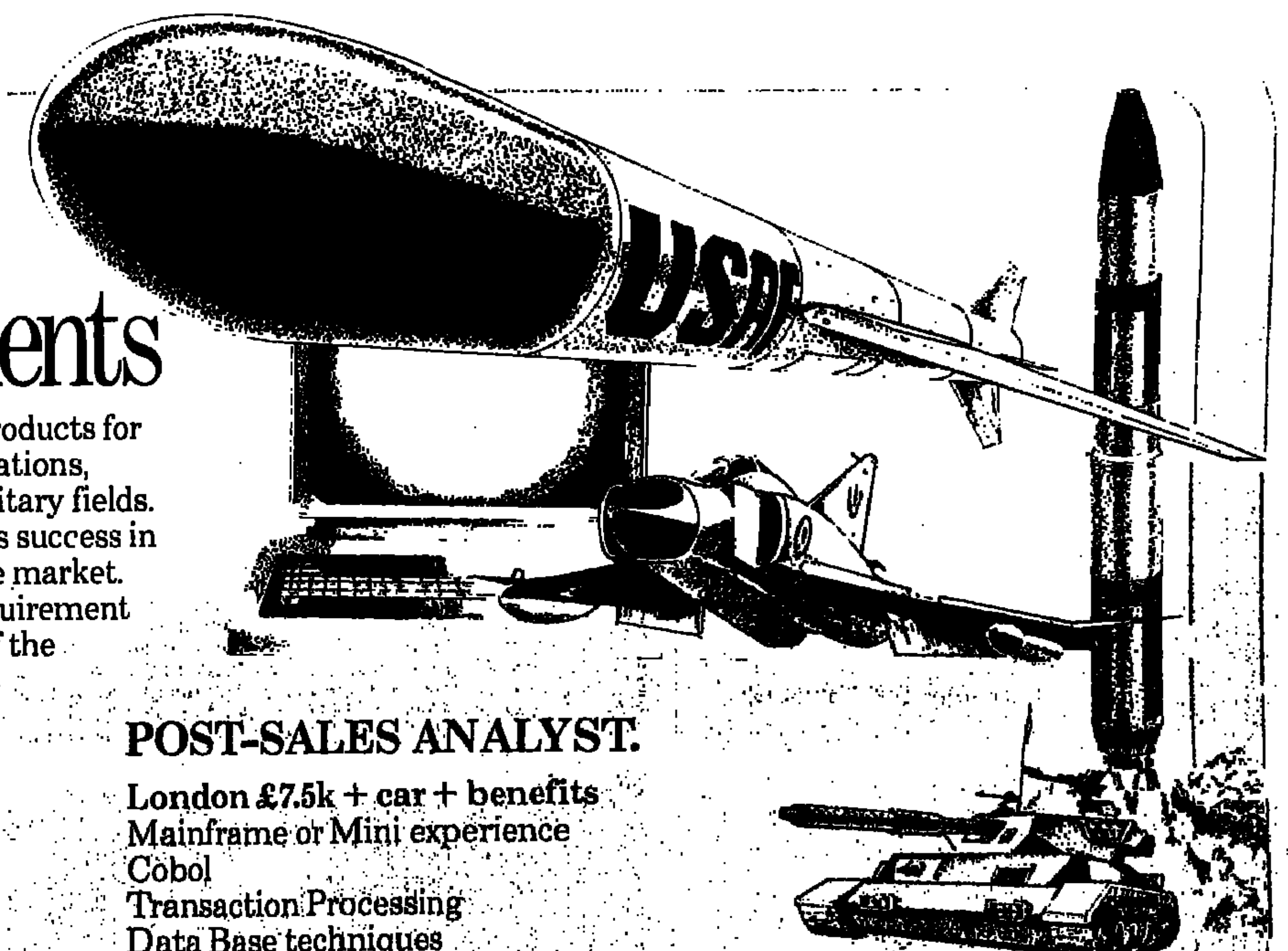
FORTRAN

FOR THE BEST JOBS IN THE SCIENTIFIC AND TECHNICAL COMPUTING FIELD — CONTACT US NOW

As specialist agents in the Engineering, Scientific and Technical industries throughout the U.K. we now deal with over 4,000 companies throughout the U.K. There is an urgent demand from these companies for experienced programmers with FORTRAN experience. Jobs from £3,500 to £8,000 all areas. Phone us now for a free list of vacancies.

Capital Appointments, 28 Windmill Street, London W1. Telephone: 01-637 5551 (day) — 01-[illegible]

Our International Clients



design and manufacture technology-based products for a wide range of business and scientific applications, including industrial, technical, space and military fields. In particular, they are experiencing enormous success in their thrust into the commercial sector of the market. Record sales have consequently lead to a requirement for professionals with expertise in as many of the following fields as possible.

PRE-SALES ANALYST.

London/Manchester £7.5k + car + bonus
Commercial or scientific background
Mainframe or mini
Cobol or Fortran
Transaction Processing
Data Base techniques
Distributed Processing
OS and Assembler an asset

POST-SALES ANALYST.

London £7.5k + car + benefits
Mainframe or Mini experience
Cobol
Transaction Processing
Data Base techniques
Communications, OS & Assembler an advantage

Please contact:- Tony Hatherall on 01-935 0671

SCR SPECIALIST COMPUTER RECRUITMENT LTD.
LONDON 01 935 0671 FREEPOST
3 Mandeville Place, Wigmore Street, W1M 5LB.

★ SENIOR MANAGEMENT ★

SOFTWARE DEVELOPMENT MANAGER	**W LONDON**	**£10,000 +**	International manufacturer seeks person for systems software environment. Building standard software with emphasis on quality. Suit manager with technical experience either with manufacturer or softwarehouse.
PROJECT LEADER	**CITY**	**£9,500**	Development of major international message switch system. Project management coupled with MACRO ASSEMBLER, RSX and RTL experience overseas travel opportunities if desired
SENIOR BUSINESS ANALYST	**CITY**	**TO £9,300**	Evaluation, preparation of revisions and re-issues of systems strategy and project management. Must have good systems analysis and business experience.
PROJECT LEADER	**ESSEX**	**£8,000 + Relocation**	This European group has openings for persons with leadership ability from ANY environment to work in real-time business and mini computer systems.
PROGRAMMING MANAGER	**LONDON**	**£8,000 + BONUS**	This major international company seeks programming manager with good COBOL experience preferably with CICS and PL/1. Position includes taking general control of programming section.
SYSTEMS ANALYST	**LONDON**	**£7,000 + + + Mortgage**	This major bank seeks person with at least 3 years systems analysis exp. Prefer ICL hardware and banking experience. Fantastic package which includes full banking benefits.

IF YOU WANT TO KNOW MORE ABOUT THESE POSTS OR ANY OF THE MANY OTHERS WE HAVE AVAILABLE — THEN RING OUR SENIOR MANAGEMENT DIVISION FOR FURTHER DETAILS

SYSTEMS AND PROGRAMMING

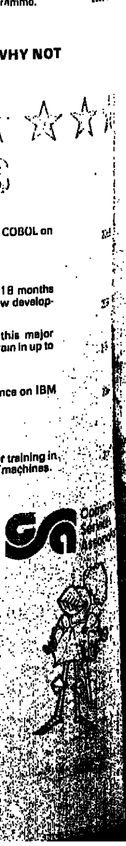
PROGRAMMERS	**LONDON**	**£7,000 + Perks**	Major IBM installation utilising CICS and database seeks PL/I and/or ASSEMBLER programmers
ANALYST	**SURREY**	**£6,500 + Sub Mort/perks**	Analyst with good insurance business acumen and experience on ANY LARGE mainframe and perhaps involvement in major systems
SYSTEMS ANALYSTS	**KENT**	**£7,000 + Perks**	Excellent opportunity to join IBM 370 installation with T.P. monitor. All new development work on financial systems. Exciting plans for future.
ANALYSTS	**C LONDON**	**to £7,800 + Bonus + Perks**	Rapidly expanding company with ICL hardware seeks systems analysts to work on major batch-processing systems. Co have exciting plans to evaluate new machinery and move into communications. FANTASTIC PROMOTION PROSPECTS.
PROGRAMMER	**LONDON**	**£6,500 + Bonus + Perks**	Go-ahead IBM installation seeks COBOL/DL/1 programmers hopefully with knowledge of CICS, TSO or MVS. Co are getting IBM 3031 shortly.
MINI PROGRAMMER	**LONDON**	**to £7,000 + Bonus**	Minimum 1 year's BASIC + experience on any mini for major PDP11 installation. Rapidly growing concern with full expansion programme.

FOR EVERY ANALYST OR PROGRAMMER WE HAVE AN EXCELLENT VARIETY OF EXCITING NEW JOB OPPORTUNITIES — WHY NOT TELEPHONE OUR SYSTEMS AND PROGRAMMING DIVISION TO SEE WHAT WE HAVE FOR YOU.

TRAINING OPPORTUNITIES

PROGRAMMERS	**LONDON**	**TO £6,000**	Do you want to get on to large IBM Mainframes — 18 months COBOL on any hardware is all you need for this major oil company.
PROGRAMMERS	**LONDON**	**£5,500 + + Mortgage**	This major BANK offers amazing PERKS to programmer with 18 months ICL COBOL exp. They are awaiting delivery of 2980's. All new development work! Do yourself a favour — phone now.
PROGRAMMERS	**CITY**	**£5,000 + Negotiable**	If you have 18 months any MINI ASSEMBLER — then this major international company with extensive DEC PDP hardware will train in up to date technology and new software.
JUNIOR ANALYST PROGRAMMER	**W LONDON/ BERKSHIRE**	**To £6,500**	Excellent opportunity for a programmer with 2 years' experience on IBM hardware ANY LANGUAGE to learn analysis.
GRADUATE TRAINEES	**LONDON SURREY MIDDX**	**To £4,500**	We now have several opportunities for trainee programmers for training in application and technical programming on IBM, ICL and Mini machines.

EXPERIENCED PROGRAMMERS WITH A DESIRE TO LEARN NEW TECHNIQUES AND HARDWARE WHO WANT TO BECOME INVOLVED IN DATABASE, TP AND EVEN SYSTEMS — SPEAK TO OUR EXPERIENCED RECRUITMENT CONSULTANTS WHO WILL BE ABLE TO GIVE ADVICE WITHOUT OBLIGATION AND CAN PUT YOU ON THE ROAD TO A NEW CAREER.



KNIGHT PROGRAMMING SUPPORT LIMITED

ROYALTY HOUSE, 72 DEAN STREET, W1. 01-734 0152/3010 (24 hrs.)

RECRUITMENT AGENCY

SYSTEMS PROGRAMMING SUPPORT LIMITED

CONTRACTS NORTH & MIDLANDS

IBM

IBM/HONEYWELL PROGRAMMERS MIDLANDS	c.£230
CICS COBOL PROGRAMMERS NORTH, MIDLANDS	c.£230
CICS PL/1 DL/1 PROGRAMMERS NORTHWEST MIDLANDS	c.£230
IMS COBOL PROGRAMMERS MIDLANDS	c.£230
IMS DB/DC PL/1 PROGRAMMERS MIDLANDS, NORTHWEST	c.£230
370 COBOL PROGRAMMERS MIDLANDS, NORTH	c.£220

ICL

1900 GII/GIII COBOL PROGRAMMERS NORTH, MIDLANDS	c.£215
2980/70 VMEB/K FORTRAN PROGRAMMER NORTH	c.£220
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1900 FILETAB/COBOL PROGRAMMERS NORTHEAST, NORTHWEST, MIDLANDS	c.£220

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PDP 11 BASIC PROGRAMMERS MIDLANDS, NORTHWEST	c.£220
BURROUGHS PROGRAMMERS MIDLANDS, NORTHWEST	c.£230

- ★ High remuneration assured throughout the year
- ★ Security of employment from continuity of work
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FOR DETAILS OF THESE AND OTHER CONTRACTS PLEASE CONTACT PERRY BUTLER/JUDY LEES ON 061-833 9341/5

PERMANENT OPPORTUNITIES

PROJECT CONTROLLER
LIVERPOOL — **to £7000**

Responsibility for all projects and continuing development of important manufacturing systems. The company currently on IBM 370 with COBOL and introducing new IBM hardware. Knowledge of ASSEMBLER and DATABASE would be an advantage. Relocation expenses and fringe benefits are offered.
Ref. 1088.

COBOL PROGRAMMER
LEEDS — **to £5712**

A self-financing productivity bonus and relocation expenses are among the benefits offered by this company. They are currently on an ICL 1904S under GEORGE THREE but are introducing new ICL hardware to be run under VMEB. Applications are of a financial and commercial nature. Promotion prospects are excellent.
Ref. 1071.

SENIOR SYSTEMS ANALYST
INVERNESS — **c£7000**

A salary rise after three months and relocation expenses are offered by our client. They require a systems analyst to work on their hardware which is currently on IBM 370 under COBOL. Their present hardware and software is under review. CICS experience would be an added advantage.
Ref. 1084.

SYSTEMS PROGRAMMER
LOCH LOMOND — **c£6000**

Assembler systems programmers with an IBM background required to become involved in IMF, DL1, DATA COMMUNICATIONS and DATA Dictionary. Position involves liaison with high level users and applications are mainly commercial. Will train applications programmer. Productivity bonus, and relocation expenses are offered. Property is very reasonably priced in this area.
Ref. 1086.

SYSTEMS ANALYSTS
LOCH LOMOND — **c£6500**

A productivity bonus and relocation expenses are offered by our client and property in this area is very reasonable. Two years' experience in financial applications is required and an IBM background with ASSEMBLER knowledge would be an advantage. The analyst will become involved in IMS and additional training will be given in DATABASE where necessary.
Ref. 1087.

PROGRAMMER
BIRMINGHAM — **c£5200**

An opportunity for a programmer to advance to a senior level and control a major project. Our client is moving site to a Birmingham location and require a senior programmer to control the move. An ICL 1903T with COBOL and PLAN is in operation. Experience in the relevant hardware and language is necessary. Knowledge of FTL6 or TAB END would be an advantage.
Ref. 1089.

FOR DETAILS OF THESE AND OTHER VACANCIES PLEASE CONTACT JOAN JOHNSTONE ON 061-833 9341

143/144 ROYAL EXCHANGE, MANCHESTER

TELEPHONE NO. 061-833 9341/5. MIDLANDS 021-236 1794. Extension 223

OCC

Specialists since 1971 in UK and International computer appointments. We have many other jobs on our files and offer a career counselling service to computer professionals.

Reading

Consultants and Project Managers	£6,500–£9,500
Analysts	£5,500–£9,500
Programmers	£4,000–£7,500

A major UK Software House is rapidly expanding its operation in the Reading area. The positions are based in Reading but there are also many other vacancies in London and Wilmslow.

Most of the projects will deal with the development and implementation of commercial applications with a certain amount of government work. Opportunities also exist to work on the development of Real Time Systems.

Senior candidates should have extensive experience in commercial systems development or may be specialists in an application or technical area.

Programmers and Analysts will work on a variety of computer systems ranging from medium size i.e. ICL 2903 to larger IBM or ICL systems.

For an informal discussion and to apply for any of the above positions, please contact Renee Nuto or Fran Setter on 01-242 9356 (day) or 01-874 6372 (evenings and weekends). Ref: 504/CW.

OCC Computer Personnel Limited,
16 Bedford Row,
London WC1R 4EB.
Telephone: 01-242 9356

Members of Computing Services Association

CAPP ASSOCIATES group provides permanent and contract recruitment services to clients and [illegible]

[illegible]

... and enjoy a varied, interesting and rewarding life as a consultant with CAPP ASSOCIATES — a leading group in the DP Personnel field, enjoying an excellent reputation.

CROYDON and [illegible] [illegible]-12,000 p.a.

A period of training and familiarisation will be provided to quickly reach full competence and to continue personal development. Our consultants are fully responsible for their own achievements with closely linked rewards made up of salary, bonuses and expenses; company cars are provided at the more senior levels.

The company's success over the last 6 years has resulted in moving into a prestige head office as a prelude to further expansion. The growth creates opportunities for consultants to join us and we want to consider people who have the personality and attitude with a DP background to join teams in both our offices working with a growing number of customers.

Our directors would like to discuss the opportunities if you have an interest in or desire to work with people and feel that recruitment offers a new way of life — the rewards are high; the work hard but satisfying and you make friends. Contact us now as our requirements are immediate.

Positions open to male & female applicants, please telephone (24 hour service) for initial discussion or write to address below QUOTE REF CW/1?E

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS — CAPP ASSOCIATES — LONDON AND MANCHESTER — Computing Services Association — 01-686 9693 — A.M.P. HOUSE, DINGWALL, CROYDON, CR9 [illegible]

Jacquard Systems

Manufacturers of sophisticated Video Computer systems used for word and data processing require

Computer Engineer

Up to £7,500 + car

The successful applicant will be able to show 3 to 4 years' experience as a customer engineer working to component level in the following areas

- Mini/Micro Computers
- Disk Drives
- Printers
- Communications

Based at High Wycombe, you will have the opportunity to travel in the U.K. and Europe. Benefits include non-contributory pension, free life insurance, B.U.P.A. membership. Please send your c.v. to, or request an application form from, R. Burgess quoting reference RB/W/233

Jean Dennington Limited

Personnel Consultants,
14 New Burlington Street, London W1X 1FF
Tel: 01-734 6134

Software Development Manager

London £10-12,000 + car

Coltec Data Systems design and manufacture computer-based type-setting equipment for the printing industry. A software specialist is required to head up the software development team which develops programs for new products and applications and tailors existing software for customer needs.

The Software Development Manager is a senior appointment in a small company and is expected to contribute to the management and policy making of the business. In particular we are looking for someone with the ability to organise and motivate the Software Department, but also with good technical understanding and experience of both low and high level language programming. He/she must be able to estimate well and have a proven record of leading a team which meets its time and cost promises.

The location is close to the City of London; prospects are excellent, depending on the results of the individual and the company as a whole. Initial salary and conditions of work are truly negotiable — but are expected to include a £10-12,000 salary and a car.

PA Personnel Services Ref: MV9/6774/CW

Initial interviews are conducted by PA Consultants. No details are divulged to clients without prior permission. Please send brief career details or write for an application form, quoting the reference number on both your letter and envelope, and advise us if you have recently made any other applications to PA Personnel Services.

PA Personnel Services
Hyde Park House, 60a Knightsbridge, London SW1X 7LE. Tel: 01-235 6060 Telex: 27874

A member of PA International

COMPUTER PROGRAMMER

Required by NALGO. Salary within range £4926-£5754 p.a. plus £312 p.a. supplement and £435 p.a. London Weighting according to experience and qualifications. To work on ICL 2904 (40K, Tapes EDS 60s and DDEs). Applicants should have had two years' experience of Cobol.

Staff restaurant. Minimum 23 days annual leave and additional leave at bank holidays. Partial mortgage interest rebate.

Application form from the General Secretary, NALGO, 1 Mabledon Place London WC1H 9AJ.

St. James Press

COBOL/ASSEMBLER PROGRAMMERS £5,000+

We are looking for Programmers with at least one year's experience, ideally in IBM environment, with COBOL and/or Assembler background.

Our location is in the City of London; we are technical publishers with particular emphasis on the travel trade and have interesting and varied work in a congenial atmosphere, age is not material.

Write now with brief career details to:

Mrs. Annabel Stein
St. James Press Ltd.
1 St. James's Street
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or telephone: 01-730 6187

MYRIAD

BORED WITH COMMERCIAL SYSTEMS? CHANGE TO REAL-TIME ENGINEERING APPLICATIONS

N.W. SURREY £4000-£7500

Due to the continued success of our client's operations, we are recruiting a range of computer personnel for a wide variety of development projects. The majority of systems are concerned with engineering, electronic or scientific applications on both mainframes and minis, with many projects utilising real-time facilities. Persons joining the company now can expect a most interesting and rewarding future in a high technology environment.

If you have one (or more) of the following:

- ★ AN ELECTRICAL ENGINEERING QUALIFICATION
- ★ CORAL 66/FORTRAN/ASSEMBLER
- ★ DATA BASE MANAGEMENT SYSTEMS
- ★ ON-LINE STOCK CONTROL
- ★ BURROUGHS/DEC/U/C EQUIPMENT
- ★ CROSS-ASSEMBLER
- ★ NETWORK COMPUTER SYSTEMS
- ★ MINI COMPUTER EXPERIENCE

our client can offer these positions:

- ★ PROGRAMMER
- ★ ANALYST/PROGRAMMER
- ★ SYSTEM SUPPORT PROGRAMMER
- ★ SOFTWARE AUTHOR
- ★ SYSTEMS PROGRAMMER
- ★ SOFTWARE ENGINEER

Salaries will be commensurate with experience but should not prove a problem to persons wishing to join the company. Located in the attractive countryside of Surrey, the modern offices are well serviced by three British Rail stations and there is a large car-park next to the building.

Ref: S2/2202

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 24 HRS.

Owing to expansion and the introduction of two-shift working, the following posts have been created within our Computer Operations Department which is using an IBM 370/138 running under DOS/VS, POWER/VS, CICS and VSAM.

SENIOR OPERATOR/CONTROLLER

Ref: CW/167
From £5189 p.a. inc.

Will be responsible to the Production Controller for the hour-by-hour operation of the Computer Room and Work Control area.

We are looking for someone with at least two years' related operating experience — one of which must have been in the capacity of Senior Operator — a good knowledge of JCL and Work Control procedures.

OPERATOR/CONTROLLER

Ref: CW/168
From £4102 p.a. inc.

For this post we are looking for someone with a minimum of one year's operating experience. A knowledge of work control procedures and DOS JCL would be a decided advantage.

Both posts have a minimum of 22 days' leave per year and we have a subsidised restaurant and a Sports and Social Club.

The Royal Borough of KENSINGTON AND CHELSEA

Application form quoting appropriate reference number from the Establishment Officer, Dept. 151, The Town Hall, Hornton Street, Kensington W8 7NX. Tel: 01-937 5562 (24-hour answering service). Application form to be returned by 2nd March, 1979.

The council welcomes applications from suitably qualified registered disabled persons.

HIGHLAND HEALTH BOARD
TREASURER'S DEPARTMENT

OPERATIONS MANAGER

Salary Scale: £4421-£5326

Applications are invited for the above post in the Computer Services Unit which is situated in the grounds of Hilton Hospital at Inverness.

The current workload encompasses a wide variety of financial together with some medical applications, all of which are processed on an ICL 2904 running under Executive 2.

Applicants should currently be employed at senior operator level or above, preferably working with ICL computers.

The successful applicant will be responsible to the Computer Manager for planning and controlling the work of the Operations Department.

Application forms and further particulars may be obtained from the Personnel Officer, Highland Health Board, Reay House, 17 Old Edinburgh Road, Inverness IV2 3HG, and should be returned not later than 9 March, 1979.

Gold Helm Executive Appointments
[illegible]
Telephone Bath (0225) [illegible]

SYSTEMS ANALYSTS PROGRAMMERS OPERATORS

OFF COURSE?

We want to steer you on the right career course for 1979.

We are a new company based in Bath, and covering D.P. recruitment throughout the West Country.

Our consultants are in contact with a variety of computer installations, suppliers and software houses, ready to discuss your job needs and available to advise you on schools and housing in the area.

All it needs to set you back on course is to write or telephone:

PAM WEBB on 0225 330311

The University of Sussex
Computing Centre

Advisory/Applications Programmer

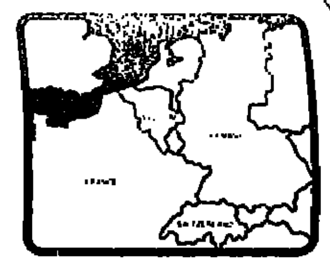
The Centre is seeking to recruit a graduate programmer to join the existing small team in an applications and advisory role. The post involves advising users of the Computing Service in programming, drafting user documentation, and giving tutorials to users. Further details are available on request.

The Centre provides services on a local ICL 1904S system and on CDC 7600 systems in Manchester and London.

The appointment will be within the faculty Other Related Grade 1A — £3,883 to £5,555 p.a. according to age, qualifications and experience.

Applications, giving two referees, should be sent to the Staff Records and Recruitment Officer, Sussex House, University of Sussex, Falmer, Brighton BN1 9RH to arrive by Friday, 2nd March, 1979.

IBM European Assignments



with CDS, an established consultancy with offices in the UK & Switzerland. These assignments are representative of our contracts with internationally respected clients, and are on a 6-monthly renewable basis.

IMS Systems Programmer

to be responsible for setting up IMS at an OS/VS1 installation in Holland and for subsequent generation, maintenance and system tuning. Applicants should have solid IMS experience (although not necessarily under VS1) and will have performed at least one IMSGEN. **£20,000+ PER ANNUM**

IMS Specialist

to act as advisor to the application development groups of an international company in Holland on all aspects of IMS DB/DC design and implementation. **£20,000+ PER ANNUM**

For further details contact Brian Bidston at CDS, or on 03446 5385 evenings/weekends

2 The Courtyard
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RG11 2BB.
Tel: (0734) 791225
Telex: 847317

IBM EUROPEAN ASSIGNMENTS

THE UNIVERSITY OF SHEFFIELD

PROGRAMMER

Applications are invited from men and women for a post of PROGRAMMER in the University Computing Services. The work will involve the writing of programs and provision of program assistance for computer users throughout the University. The post might suit a recent graduate in Computer Science or in a related subject. Candidates should have an interest in programming in a high level language, and a willingness to specialise in an area such as data bases, graphics, statistics or scientific programming. Salary according to qualifications and experience on the Other Related Staff Grade 1B salary scale £3,384-£4,892.

Particulars from the Registrar and Secretary, the University, Sheffield S10 2TN to whom applications should be sent by 16th March, 1979. Quote ref: R233/B8.

COBOL PROGRAMMER

BASINGSTOKE, HANTS

A vacancy exists for a Programmer with experience in IBM COBOL to OS/VS1. Knowledge of JCL would be an advantage.

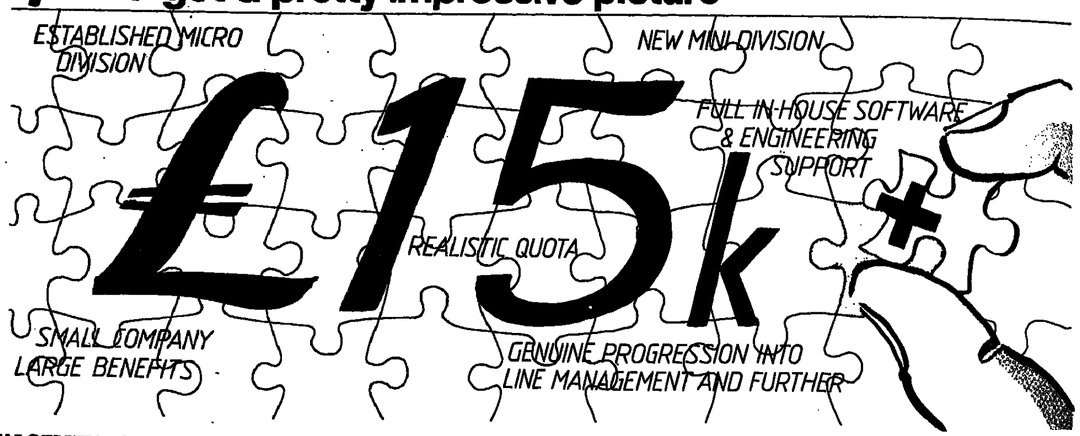
Employment benefits are those associated with a large engineering company and include subsidised canteen, four weeks' annual holiday, pension and life assurance, sick pay scheme, active sports and social club.

Apply to Personnel Department, Eaton Ltd., Transmission Div., Worting Road, Basingstoke, Hants. Tel: Basingstoke 3221 ext 237.

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

When you put all the pieces together, you've got a pretty impressive picture



MANAGEMENT & EXECUTIVE SELECTION

Contact Tony McGrath
Suite 201/6, Albany House, 324 Regent Street, London W1R 5AA 01-637 9611

COMPUTER BUSINESS/SYSTEMS ANALYST

DUBLIN

Our client, one of the largest Industrial Groups in Ireland, with diversified business interests, wishes to appoint a **Business/Systems Analyst.**

They currently operate an **IBM 370 Computer System** and will soon begin to install a distributed processing network, utilising **interactive Minicomputer Systems.**

The successful candidate will work very much as a Client/User representative implementing dynamic systems for a progressive management team.

Ideally he should be a bright and well motivated computer professional with **sound business experience** and should have:

— 4/5 years Analyst/Programmer experience (at least 2 of them with on-line applications)

— Implemented major projects.

— Ability to communicate well with Users.

THE REWARDS:

In addition to a **variety of work** in a progressive environment, you will receive an **attractive salary.** Fringe benefits are first-class and include career development, training and non-contributory pension. Relocation assistance will be available where appropriate.

All applications will be strictly confidential and your identity will not be disclosed to our client without your prior consent.

Telephone/Write NOW to Pat Rafter or Eamonn Cooper — Quote Reference No. CW19.

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Telephone 681168, 681277

IRELAND'S FOREMOST PERSONNEL CONSULTANTS TO THE COMPUTER INDUSTRY

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£22-£25K (This is salary NOT the total package)

PUT YOUR ENGINEERING KNOWLEDGE AND PROFESSIONALISM TO GOOD USE IN EUROPE.

JOIN OUR CLIENTS WHO HAVE A NEED FOR A NUMBER OF HARDWARE SPECIALISTS, EXPERIENCED IN THE FOLLOWING DISCIPLINES TO LIVE AND WORK IN EUROPE.

1) **DISK DRIVE** Specialist, who is an in-depth Technical Expert on Drives and Controllers, with experience specifically allied to IBM 360/370 Mainframe Systems.

2) **PROCESSOR** Specialist, with a high degree of IBM Mainframe experience, to work within the ADD on Memory section, where the need for processor knowledge is paramount.

3) **COMMUNICATIONS** Specialist, who will have an in-depth general background in all aspects of DATA COMMUNICATIONS, and although this position does not necessitate an IBM background, a knowledge of S.D.L.C. protocol and S.N.A. would be advantageous.

You will be working for a large and prosperous Company who can offer excellent Career opportunities for ENGINEERS with a MATURE outlook and the ambition to capitalise on their specialist knowledge.

In the first instance call us quoting REF. JMC/10.

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Computing in British Gas

As part of the increased emphasis which British Gas is placing on computing, applicants for two senior posts are being sought. British Gas makes extensive use of computers, both in serving the needs of its 14 million customers and in tackling its scientific, administrative and management information requirements. It has substantial investment in large mainframe computers at 12 Regional and 2 Headquarters sites.

Computer Services Manager

Based at Fulham — up to £11,000

The Computer Services Manager will head the Corporation's Headquarters' Computer Department at Fulham. The Department has a Univac 1106 computer which handles a mixed on-demand and batch work-load but the installation of a more powerful computer and enhanced accommodation is planned. As well as serving the Corporation's London Headquarters' operational and software development needs, there is a requirement for the Department to make a substantial contribution to computer developments throughout the Industry.
Applicants should be graduates and/or have an appropriate professional qualification. Extensive computer experience is required, together with proven managerial ability in a computer environment. (Ref. 145/1).

Computer Policy Manager

Based at Holborn — up to £11,000

The Computer Policy Manager will lead a small team in formulating, assessing, monitoring and presenting the Corporation's hardware strategy and computer development plans.
Applicants should be graduates and/or have an appropriate professional qualification. Extensive technical computer experience is required, together with innovative skills and demonstrable planning judgement. The post requires a tactful and articulate person with proven ability in successfully communicating with senior management. (Ref. 145/2

Applications from men and women giving personal details and full information on qualifications and experience should be addressed, quoting the appropriate reference number, to the Personnel Manager, British Gas Corporation, 59 Bryanston Street, London W1A 2AZ, as soon as possible.

BRITISH GAS

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A division of ATA Selection and Management Services, recruitment consultants to industry and commerce since 1962

WEST COUNTRY
370 DOS/VS OPERATORS
£4523 p.a. + BENEFITS

Our clients are a well established national company in the food industry and enjoy recognised market leadership on many of their products.

The upgrading of their 370/135 to a ½ megabyte and the development of their on-line teleprocessing network necessitates additional operators with experience of working within a 370 environment.

The benefits include substantial discounts on their foodstuffs and subsidised canteen facilities.

Generous RELOCATION ASSISTANCE is available. For further information telephone 0272-211035 or alternatively write enclosing a detailed curriculum vitae to IAN BAKER.

ATA COMPUTER RECRUITMENT
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36/38 Baldwin Street
Bristol BS1 1NR

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BRISTOL (0272) 211035 EDINBURGH (031) 226 5381 CRAWLEY (0293) 514071
SOUTHAMPTON (0703) 37655

SOFTWARE PROFESSIONALS
INFORMAL INTERVIEWS

Great Eastern Hotel
Liverpool Street,
London EC2
Tuesday 27th Feb.
Noon — 8.30 pm

George Hotel
High Street, Colchester
Monday 26th Feb.
5.00 — 8.30 pm

Mercury Motor Inn
(formerly Fairlane Motor Hotel)
Southend Arterial Road,
Romford, Essex
Tuesday 27th Feb.
5.00 — 8.30 pm

Saxon Motor Inn
Southern Way,
Harlow, Essex
Wednesday 28th Feb.
5.00 — 8.30 pm

County Hotel
Rainsford Road,
Chelmsford, Essex
Wednesday 28th Feb.
5.00 — 8.30 pm

Our new Data Systems Division requires staff AT ALL LEVELS particularly **Senior Programmers and Senior Analysts.**

This is an exciting time to join us and we are looking for talented men and women who wish to be involved in interesting work in a Progressive Division.

Ideally, we seek applicants with experience of Real Time Systems in a technical environment. However, we're equally interested in those possessing broad-based computing backgrounds with the potential for increasing their responsibility.

Why not find out more by coming along to one of our informal interviews? Just ask for our staff who will be pleased to tell you about career prospects, financial rewards and the challenging job opportunities available.

If you can't make it, but want to know more, please contact Brian Edwards at Marconi Radar Systems Ltd., 'Freepost', Chelmsford CM1 3BR (No stamp required). Telephone Chelmsford (0245) 67111.

Marconi Radar
A GEC-Marconi Electronics Company

UNIVERSITY OF GLASGOW

LECTURESHIPS IN COMPUTING SCIENCE

Applications are invited for three lectureships in the Department of Computing Science tenable from 1st October 1979. It is hoped that one of these appointments will have an interest in the design of microprocessor systems.

Salary will be within the range £5,838 to £8,250 per annum (under review) according to age, qualifications and experience.

Further particulars may be obtained from the Secretary of the University, 4 The Square (Room 18), University of Glasgow, G12 8QQ, to whom applications (8 copies), giving the names and addresses of three referees, should be sent not later than 15th March 1979.

In reply please quote Ref. No. 4389

UNIVERSITY OF ST. ANDREWS
Secretary's Department

Systems Analyst/Programmer

Applications are invited from graduates with appropriate computing experience for a post of Systems Analyst/Programmer to work on the development of the student record system. The new system will operate on a DEC 1050 Computer.

Salary at appropriate point according to qualifications and experience on the Administrative Grade 1A scale £3384-4918. Superannuation under USS.

Applications, with the names of two referees, should be sent by 12th March, 1979 to the Establishments Officer, the University, College Gate, St. Andrews, Fife, from whom further particulars may be obtained.

UNIVERSITY OF OXFORD

The Computing Service supports teaching and research throughout the University by means of local ICL 2980 and 1906A Systems and via links to CDC 7600 at Manchester and London. A service is also provided to seven other Universities in the South East Region on the ICL 2980

Planning and Development Manager

To lead a group of Software and Hardware staff working on VME/B, Compilers, Graphics and Communications.

Salary scale. £7,506-£9,263

System Programmer

To be responsible for maintenance of VME/B and some development work

Applications Programmer

To implement packages with particular emphasis on statistical work

Digital Engineer

To work with microprocessors, a qualification in Electronics or relevant experience is necessary.

Initial salary for the last three posts

on scale 1B £3,384-£5,604
or scale 1A £3,384-£6,556

Write or telephone the Director's Secretary to arrange suitable contacts with existing staff and for an application form: OXFORD UNIVERSITY COMPUTING SERVICE, 13 BANBURY ROAD, OXFORD OX2 6NN. Tel: (0865) 56721.

Programmers of Mini Computers
FOR COMPUTER CONTROL

If you are a trained Engineer or Scientist here is your chance of a challenging future programming the most up-to-date control computers and micro-processors.

The CEGB requires SYSTEMS ANALYSTS/ PROGRAMMERS and suitable trainees to work on Computer Control Aids for its modern power stations and system control centres.

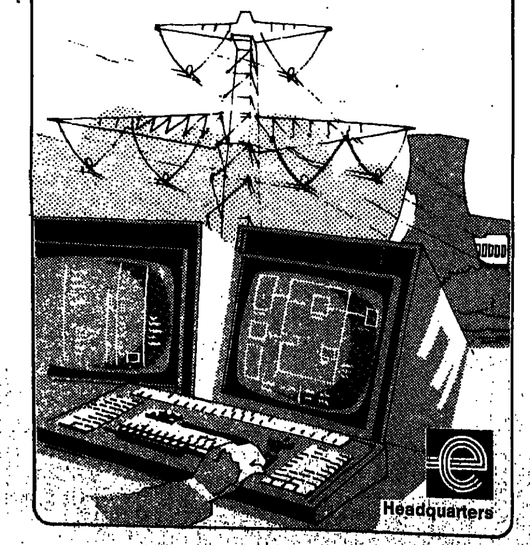
Successful candidates will work on the design and implementation of Operating Systems, Data Acquisition and Recording, Display Packages, Direct Digital Control and Language Developments

Though experience is an advantage for these posts, alertness and intelligence are the main pre-requisites training being given where necessary The posts are at our London Offices located near St Pauls, and at our Nuclear Power Training Centre at Oldbury near Bristol.

The Salaries for these appointments will be within a range.

£3674-£6735 pa inc.

Applications stating full relevant details and present salary to the Group Personnel Officer, **CENTRAL ELECTRICITY GENERATING BOARD,** Sudbury House, 15 Newgate Street, London EC1A 7AU, by **4 March 1979.** Quote Ref. **CW/44.**



Ministry of Agriculture, Fisheries and Food
Directorate of Fisheries Research, Lowestoft

Senior Computer Programmer

The Research Support Group of the Fisheries Laboratory, provides an expert technical information and programming service to scientists engaged in fisheries and aquatic environmental research projects. The computer programmer appointed will specify, write, test and document programs in FORTRAN, COBOL, and FILETAB, supervise and train junior computer programmers, and advise on programming and the use of computer systems. Occasional participation in research cruises may also be involved.

The computing facilities consist of an HP3000 with 144K word core, disc units, LT 100 terminals and graphics facilities, and an HP 2100 with 96K store. A DG NOVA 3 system is expected to be installed in the near future. In addition, there are RJE and interactive terminals to an ICL 1904S computer in Guildford.

Candidates should normally have a degree/HND/HNC or equivalent in mathematics or computer science and several years' relevant experience.

Appointment as Higher Scientific Officer (£4,605-£5,450) with starting salary according to qualifications and experience. Promotion prospects. Non-contributory pension scheme.

For further details and an application form (to be returned by 23 March 1979) write to Civil Service Commission, Alencon Link, Basingstoke, Hants RG21 1JB, or telephone Basingstoke (0256) 68955 (answering service operates outside office hours).

Please quote ref: SIB/4371/AD.

Science Group CIVIL SERVICE

Research Assistant
(Ref: DTR.6) £4680 to £5508 p.a. inclusive

Technical Assistant
(Ref: DTR.9) £3258 to £5067 p.a. inclusive

According to qualifications and experience

Two people are required for the Transportation Research Group which is involved in the design of schemes for bypass management, road safety and parking control. Suitable candidates are likely to have had traffic engineering experience with a local authority or in the Police.

Modern offices. Flexible working hours. Staff restaurant.

Application forms from Assistant Director (Personnel), London Borough of Hammersmith, Hammersmith House (BOC Building), Black's Road, London W6 9EC, quoting appropriate ref. number. Closing date: 9th March, 1979.

Applications welcomed from Registered Disabled Persons.

Operations Directorate **Hammersmith**

PROGRAMMERS

COBOL Programmers are required at our corporate headquarters in Stamford Conn. A minimum of 3 years' experience is required with experience of comms and applications programs on a DOS/VS System. A single person is preferable for an initial 2 year contract, benefits of free medical/life insurance and profit sharing/bonus are offered in addition to the above salary.

U.K. — SUNBURY £5,500

A Cobol programmer with two years' experience is also required to work at our European D.P. Headquarters in Sunbury, Middlesex. Initially working on a 360/50 DOS System the job offers scope for increasing responsibility and involvement as the European data processing requirements increase and our installed minis progress towards a distributed processing network.

If interested write to:

JEFF MALLINDER
Air Express International Agency Inc.
51 Staines Road West
Sunbury on Thames
Middlesex TW16 7AH
or telephone Sunbury
(09327) 88312/2

AEI

SYSTEMS ANALYSTS
BLACKFRIARS

DIRECT MAINLINE FROM BROMLEY, BECKENHAM LEWISHAM, DARTFORD, CRAYFORD, WIMBLEDON SUTTON, ETC. FARRINGDON STREET, BLACKFRIARS AND CHANCERY LANE UNDERGROUND AND HOLBORN VIADUCT — ALL CLOSE BY!

STARTING SALARY TO £7,500

(Our clients will also consider Programmer/Analysts at a salary to £6,300.) Other benefits include a 6½-hour day (say 9 a.m.-4.30 p.m. with an hour for lunch), non-contributory pension scheme and subsidised canteen.

ALL NEW DEVELOPMENT WORK

On commercial applications processed on a sophisticated Univac 90/30 with a possibility of on-line real-time work in the future.

Join a young, enthusiastic team of some 30 professionals and benefit from full management backing and encouragement. Prospects are excellent and there is a very positive attitude to promotion from within.

These are truly first-class opportunities for the right people. Telephone me, Bob Bower, for an initial discussion and I am convinced you will agree!

Ref. CW2229

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

Pensions and Insurance Computer Services

Lead Programmer (Central London) Salary to £7.5K

We are one of the fastest growing pensions and insurance services companies in Britain, and expanding into new fields all the time. We have recently become part of Unilever Computer Services Ltd., one of the largest bureaux in the UK, which itself is a member company in the Unilever group.

We require a competent senior programmer with 3-4 years experience in IBM systems to lead all programming work at P.I.C.S. and deputise for the Programming Manager. This senior post is an opportunity for the technical expert, who may want to progress his career without moving into analysis or sales. Someone working in a pensions or insurance environment would be at an advantage.

We offer a career challenge and the opportunity to put computers to actuarial work. Benefits from working with us include, career development within a multi-national concern, four weeks annual leave, sports and social facilities, and assistance with relocation.

For an application form and further information write to:— Matthew Webster, Personnel Officer, UCSL, Station House, Harrow Road, Wembley, Middx. HA9 6EB or Telephone 01-903 1414.

UCSL

UNILEVER COMPUTER SERVICES LIMITED

MINISTRY OF DEFENCE
ARMY PERSONNEL RESEARCH ESTABLISHMENT
FARNBOROUGH, HANTS

Higher Scientific Officer/ Scientific Officer

(Computer Programmer/Systems Analyst)
(period appointment)
For Applied Physiology and Field Trials Division

A Higher Scientific Officer (or Scientific Officer) is required for a period of 3 years to assist staff studying the factors affecting human performance in the military environment.

The post will be held by a person of independent character who can work in an inter-disciplinary team without close supervision. The successful candidate will be responsible for the development and use of techniques to collect and analyse data obtained in experiments on human subjects. Present facilities for data handling include both digital and analogue computers with appropriate peripherals (e.g. a PDP11/34 on site and access to an ICL 1900). It is expected that a wide range of challenging problems will be generated by the rapidly expanding research programme. The major areas of current work include noise, vibration and thermal stresses; musculo-skeletal problems of operating vehicles and weapons; exercise; and the physiological and ergonomic evaluation of protective clothing systems.

QUALIFICATIONS AND EXPERIENCE:
Degree, HND/HNC or equivalent, in computing sciences or a related discipline and several years' experience of the application of computing techniques. Some contact with the evaluation of physiological and environmental data would be an advantage.

AGE:
Normally under 30

SALARY:
Appointment for a fixed period of three years as Higher Scientific Officer (£4100-£5448) or Scientific Officer (£2840-£4415) according to age and qualifications.

Application Forms quoting reference 454/02/02 (for return by 6 March) from Ministry of Defence, CM(S)1b3, Room 310, Savoy Hill House, Savoy Hill, London, WC2R 0BX.

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datascene

OPERATORS

Junior and Senior Operators with a minimum of 6 months experience on any mainframe required urgently. Listed below are a small selection of current vacancies.

IBM	SYS 3	Ops Mgr	4 yrs	£6000
IBM	SYS 3	Operator	1 yr	£4200
IBM	OS	S/Ldr	4 yrs	£6000
IBM	OS	Operator	1 yr	£4300
IBM	DOS	Operator	1½ yrs	£4500
IBM	DOS	Jnr Op	6 mths	£3800
ICL	GII	Snr Op	2 yrs	£4600
ICL	GIII	Operator	1 yr	£3800
ICL	2900	Op—Days	1 yr	£3500
ICL	ANY	Operator	6 mths	£3800
H'WELL	GCOS	Snr Op	1½ yrs	£4800
H'WELL	ANY	Jnr Op	6 mths	£4000
UNIVAC	EXEC 8	Snr Op	2 yrs	£5700
UNIVAC	EXEC 8	Operator	1½ yrs	£4800
UNIVAC	OS3	Snr Op	1 yr	£4200
NCR	B3	Operator	6 mths	£4000
NCR	B3/B4	Snr Op	1½ yrs	£4500
DEC	PDP/11	Operator	6 mths	£3800

DATA CONTROLLERS

Required urgently in all areas. 6 months' plus experience, salaries £3000-£6000.

Datascene Recruitment Limited
Sceptre House
169-173 Regent Street
London W1R 7FB
01-439 7871
24 hour answer phone

ERI Specialists in recruitment for the Middle East

Computer Salesman Saudi Arabia

c £10,000 (Tax Free) plus commission

▲ Our client a communications arm of the large Juffali Group has been appointed exclusive distributors for General Automation within Saudi Arabia and as such, wish to recruit a salesman from the field of computers.

▲ Candidates aged up to 35 years must be experienced salesmen and conversant in Mini Computer Applications, Data Collection, Communications Control, Configuration of Processors and have good appreciation use of Software Systems in Batch and Real time. Ideally candidates should have a high level of COBOL and/or FORTRAN languages.

▲ Contract offered will be for one year in the first instance on single or bachelor status and other conditions to include provision of motor car, free furnished accommodation, free medical arrangements, U.K. leave, etc.

Please write quoting ref: 4/CW/1 and giving details of qualifications, experience and domestic circumstances to Michael R. Andrews, Executive Resources International, U.K. Office, 87 Jermyn Street, London SW1Y 6JD or telephone 01-839 4786 for an application form. Short listed applicants will be notified within three weeks.

Data Processing Department

Support Officer

AP3/4 £4017 to £4917
(including supplement and London weighting)

Are you a Shift Leader, Senior Operator or Senior Control Clerk with at least two years' experience of IBM DOS/VS POWER/VS and currently looking for career advancement in a challenging non-shift role? Then you may be interested in joining our young and enthusiastic operating team, working in pleasant surroundings at Bexleyheath on a recently installed 1 megabyte IBM 370/138 using DOS/VS POWER/VS and CICS with an extensive communication network and Redifon R300 data entry equipment.

You will be a member of a small team responsible for providing a general operating support service to the installation and its users, involving the set up and control of all new work from the final stages of system development through to live processing, the preparation of operating procedures and customer liaison functions.

For further details or an application form please write or telephone (01-303 7777 ext. 782), D. Jarvis, Operations Manager, Data Processing Department, 9 Brampton Road, Bexleyheath, Kent DA7 2EZ.

Closing date 16 March, 1979.

Bexley London Borough

It's grey matter not sales patter that'll make you a success selling with digital

When Digital invented the mini-computer we sparked off a revolution. The demand for mini-computer systems for commercial and technical applications has never been greater and it is expanding all the time.

If you've experience of the commercial or technical uses of computers, are excited by new technology and the changes it is bringing about, you'll be attracted by the offer we're making at Digital.

We're looking for more men and women to join our sales force in the South East. Our style of selling is different. No amount of smooth sales talk can sell a product that's not right for the job, so we're looking for people with the ability to match our products with the needs of our customers. People who can, from their own experience, identify and understand those needs and come up with the ideal solution.

We're looking for people to manage existing accounts and open up new areas in the following S.E. markets:

Commercial Systems Based Central London

If you've around 3 years' experience of selling computing equipment into the business DP market you'll have gained the technical sophistication and knowledge of business applications and software necessary to help us increase our market share. Naturally, you'll have the confidence and ability to deal at senior management level with a wide range of customers, and the motivation to make the most of our opportunities for career progression.

Technical Systems Based Epsom

Increasing use of micro-electronics in industry creates a rich market for the technically oriented sales professional. We're looking for someone with a degree or HNC in science or engineering and good systems software, computer applications or project management experience to take the initiative in selling into this valuable market. Some sales or marketing experience in a similar discipline would be an advantage.

In whichever area you join us, you'll enjoy working with Digital. We're young, progressive, informal but highly professional— a company which combines rapid growth and commercial success with the all important human touch. We also offer attractive salaries, a choice of company car and a comprehensive range of fringe benefits. Promotion prospects are first class—as you'd expect from an expanding, people oriented company.

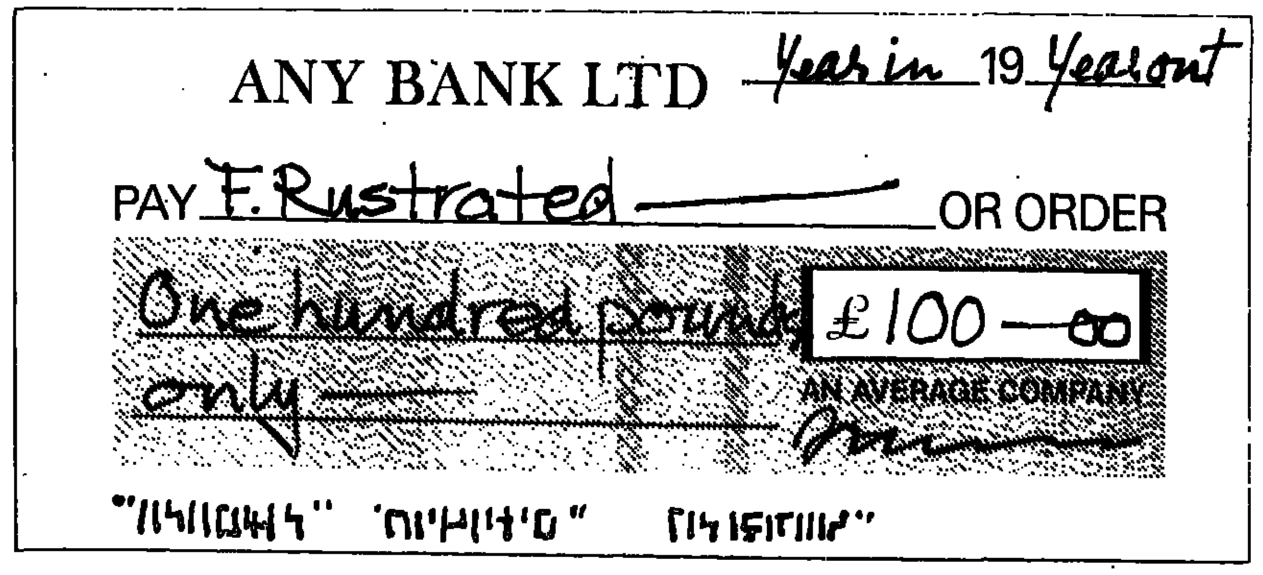
For more information write or telephone for an application form to: Jayne Huggins, Digital Equipment Company Limited, Old Manor House, 17 West Street, Epsom, Surrey. Telephone Epsom 78 29666, quoting reference 515.

P.S. Other sales opportunities exist throughout the United Kingdom.

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

DOES YOUR COMMISSION CHEQUE TELL YOU THE SAME OLD SAD STORY MONTH AFTER MONTH?



QUOTA EARNINGS OF £25K

- Territory management in the Eastern half of England. Ideally based in the South-East.
- Existing high volume of business derived from OEM and resale accounts form a major base for this territory.
- Selling a sophisticated family of Visual Display Terminals.
- Established company with a high reputation.
- Candidates will ideally be aged between 25 and 35.
- Salary, generous car allowance and commissions will provide a genuine 25k income for the 100% performers.

Contact Faye Ogilvie

Suite 201/6, Albany House, 324 Regent Street, London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

Computing in British Gas

As part of the increased emphasis which British Gas is placing on computing, applicants for two senior posts are being sought. British Gas makes extensive use of computers, both in serving the needs of its 14 million customers and in tackling its scientific, administrative and management information requirements. It has substantial investment in large mainframe computers at 12 Regional and 2 Headquarters sites.

Computer Services Manager

Based at Fulham up to £11,000

The Computer Services Manager will head the Corporation's Headquarters' Computer Department at Fulham. The Department has a Univac 1106 computer which handles a mixed on-demand and batch work-load but the installation of a more powerful computer and enhanced accommodation is planned. As well as serving the Corporation's London Headquarters' operational and software development needs, there is a requirement for the Department to make a substantial contribution to computer developments throughout the Industry.

Applicants should be graduates and/or have an appropriate professional qualification. Extensive computer experience is required, together with proven managerial ability in a computer environment. (Ref. 145/1).

Computer Policy Manager

Based at Holborn up to £11,000

The Computer Policy Manager will lead a small team in formulating, assessing, monitoring and presenting the Corporation's hardware strategy and computer development plans.

Applicants should be graduates and/or have an appropriate professional qualification. Extensive technical computer experience is required, together with innovative skills and demonstrable planning judgement. The post requires a tactful and articulate person with proven ability in successfully communicating with senior management. (Ref. 145/2/CW).

Applications from men and women giving personal details and full information on qualifications and experience should be addressed, quoting the appropriate reference number, to the Personnel Manager, British Gas Corporation, 59 Bryanston Street, London W1A 2AZ, as soon as possible.

BRITISH GAS

Pensions and Insurance Computer Services

Junior Analyst (Central London) Salary to £6.5K

We are one of the fastest growing pensions and insurance services companies in Britain, and expanding into new fields all the time. We have recently become part of Unilever Computer Services Ltd., one of the largest bureaux in the UK, which itself is a member company in the Unilever Group.

We require a Junior Analyst to understudy Senior Systems Analysts working in computer applications to pensions and insurance work. This post would probably suit a programmer with an IBM background moving into systems.

Also, a recently qualified person with actuarial or computing exposure wishing to pursue a career in this field, would be eligible. He/she would be required to involve themselves in detailed design, development and testing of systems for new applications, using specifically written software or packages.

We offer a career challenge and the opportunity to put computers to actuarial work. Benefits from working with us include, career development within a multi-national concern, four weeks annual leave, sport and social facilities, and assistance with relocation.

For an application form and further information write to:— Matthew Webster, Personnel Officer, UCSL, Station House, Harrow Road, Wembley, Middx. HA9 6EB or Telephone 01-903 1414.

UCSL

UNILEVER COMPUTER SERVICES LIMITED

SOFTWARE DEVELOPMENT ENGINEER

Salary up to £8,000 p.a.

AN ENGINEER IS REQUIRED TO WORK ON THE DEVELOPMENT OF FIRE AND GAS ALARM EQUIPMENT FOR PROTECTION OF OIL PRODUCTION PLATFORMS.

MICROPROCESSOR AND GRAPHICS EXPERIENCE IS ESSENTIAL, AND A WORKING KNOWLEDGE OF ELECTRONICS IS DESIRABLE.

For more information please telephone Mr. M. Norton on 01-543 1241, or apply in writing to:—

GP-ELLIOTT ELECTRONIC SYSTEMS LTD.
61 High Path
Merton, London, S.W.19

Chief Applications Programmer

Applicants should be fluent in FORTRAN and have knowledge of some relevant applications packages.

Chief Program Adviser

Applicants should be able to program in at least two languages FORTRAN COBOL BASIC or ALGOL and have experience in dealing with people.

The Department provides a service to the Polytechnic based on the DEC 20 timesharing machine plus a PDP 11/40 and a Data General Nova.

Salary for both posts:

SO1 scale [illegible] plus a supplement of [illegible]

Further details and forms of application available from the Assistant Director and Chief Administrative Officer, Trent Polytechnic, Burton Street, Nottingham. Applications as soon as possible.

TRENT POLYTECHNIC NOTTINGHAM

SYSTEMS ANALYSTS SALES EXECUTIVES

ADVANCE YOUR CAREER WITH THE BIGGEST IN THE BUSINESS

CONTROL DATA is the world's largest computer services organisation, utilising IBM (3031) and CONTROL DATA EQUIPMENT (Cyber 170) and providing a comprehensive range of specialised products to industry and commerce.

We are seeking accomplished SYSTEMS ANALYSTS with experience of creating computer systems for commercial and industrial applications who now wish to take up a career in selling. We would also like to meet EXPERIENCED SALES EXECUTIVES who can benefit from entering a company environment which is truly aware of the individual need for comprehensive ongoing training and career advancement.

Job opportunities currently exist in:

THE MIDLANDS
AND
LONDON & HOME COUNTIES

Remuneration will be by way of basic salary and commission. Established salesmen can expect to earn:

circa £10,000 p.a. + company car

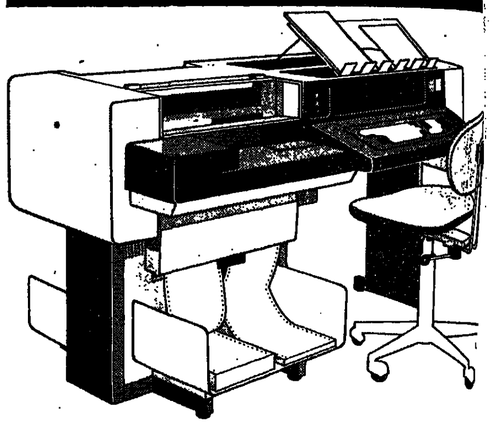
Please supply complete career details, quoting reference DPS 029, to:
Alan Williams or Caroline Connabeer,
SMR SALES & MARKETING RECRUITERS LTD
Victory House, 99 Regent Street, London W1R 7HB
Telephone: 01-734 9776

CONTROL DATA
MORE THAN A COMPUTER COMPANY

Magnetic Media Manufacturing Division

SYSTEMS ANALYSTS ANALYST PROGRAMMERS PROGRAMMERS

6 good reasons why you should join KIENZLE



1 MONEY
YOU COULD EARN UP TO £8,500

We pay a generous basic salary and substantial bonus (no upper limit) based on ability and effort. In addition, we also pay car/travel allowances to our software people.

2 SYSTEMS
WORK ON A VARIETY OF APPLICATIONS

We are not an in-house computer operation. We provide software support to 700+ clients across the U.K. In providing support for these clients, you will work on a wide variety of commercial applications and increase your business systems knowledge and experience extremely rapidly.

3 MACHINE RANGES
INCREASE YOUR TECHNICAL EXPERIENCE

We support four ranges of computer. As a Manufacturer, we frequently release new equipment to keep pace with technology and the demands of the market place. You will be trained to support more than one range of machine.

4 FIELDWORK
MEET OUR USERS

You will work closely with high level client representatives during project development and implementation at their Offices and ours. These are not desk bound jobs.

5 OPPORTUNITY

We are a computer company. It therefore logical to conclude that the best computer people move upward into management and other high level positions much more quickly than in any other environment. We promote from within.

6 FRINGE BENEFITS

Flexible working hours. BUPA. Pension and disability scheme. Subsidised canteen. Four weeks holiday. Modern clean offices. Good working conditions. Social club. Free car park.

COME AND TALK

If you have at least 6 months data Computer, Mini-Computer Mainframe experience we would like to meet you. People with COBOL or ASSEMBLER experience would be of particular interest to us.

ACT NOW!

CALL SLOUGH 33855
Telephone David Cullis, our National Software Manager for a short chat and an application form. If you are long distance reverse the charge (UK ONLY) or simply put the coupon in the post.

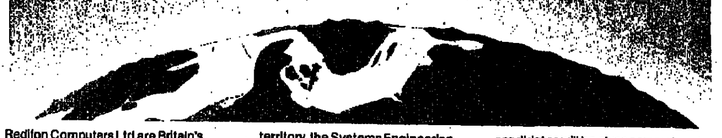
SEND YOUR FORM TO MY HOME...

KIENZLE Computers

Branches also at Birmingham, Bristol, Bury St Edmunds, Manchester, Tunbridge Wells, Washington, Aberdeen (agent) and Dublin.

We say Kienzle, You say KEENS-LEE

INTERNATIONAL COMPUTER SYSTEMS ENGINEERS



Redifon Computers Ltd are Britain's second largest, fastest-growing computer company. In five years our turnover has grown eightfold

Part of our growth includes the expansion of our International Systems Engineering Department. We need the following people to join us in this fast-moving sector of the computer industry.

Systems Engineering Manager (Overseas)
To control all facets of engineering and spare parts in a complete territory, to manage a team of contract and sub-contract engineers, and to run a service depot.

To ensure the profitability of the territory, the Systems Engineering Manager will be given full financial responsibility.

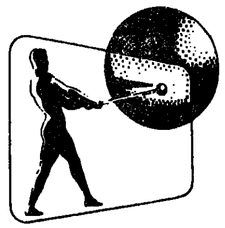
Systems Engineers (Overseas)
Duties will include technical support activities, installation of new systems, and general duties associated with the work of the International Department.

Test Technicians (Overseas)
To repair and test sub-assemblies and peripheral mechanisms, in a fully equipped repair depot.

A first class remuneration package is offered, including generous overseas allowances and company car, plus the usual benefits of working for a major international organisation. Successful candidates will be given comprehensive product training at our headquarters in Crawley.

Our growth provides excellent career prospects, so—If you've got at least 4 years experience in Field Engineering, and a desire for overseas travel, write or telephone for an application form to Marion Barnes, Redifon Computers Ltd, Kelvin Way, Crawley, Sussex RH10 2LY. Telephone: Crawley (0293) 31211 Ext. 278.

REDIFON COMPUTERS LIMITED
Member Company of the Redifon Organisation



THE RANK ORGANISATION
MANAGEMENT SERVICES

OPERATORS

THE RANK ORGANISATION, one of the leading companies in the leisure industry and one of the largest manufacturers and distributors of top quality TV and hi-fi equipment in the UK now require OPERATORS to join their efficient and friendly Computer Centre. Equipment and Software is based around an IBM 370/138 with DOS/VS, POWER VS and Teleprocessing and also expanding rapidly in RJE and Distributed Processing mainly using IBM System 34 mini computers.

OPERATORS to £4240

At least 12 months' experience in a DOS environment is required to join the Operations Team. Training facilities encompass both external courses and internal education and it is therefore an ideal environment to develop computer skills. Operator performance is reviewed regularly and opportunities exist for promotion to Senior Operator and Shift Supervisor. Career prospects are excellent with scope for diversification into other areas of OPERATIONS or PROGRAMMING.

The Company is situated in Whyteleafe, Surrey, in pleasant rural surroundings and Fringe Benefits include: PAID OVERTIME, PENSION SCHEME, SUBSIDISED STAFF RESTAURANT AND STAFF DISCOUNT ON HOLIDAYS/ HI-FI/TV etc.

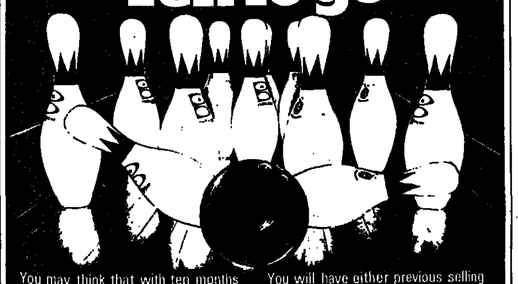
For further information and an application form please contact:—

TUNBRIDGE WELLS (0892) 35712
24-HOUR ANSAFONE SERVICE

COMPUTENT

14 MOUNT PLEASANT TUNBRIDGE WELLS TELEPHONE TUNBRIDGE WELLS 35712/3/4

Two down ~Ten to go



You may think that with ten months to go, you've plenty of time to make 1979 a challenging year.
Why wait? The time will go before you've achieved your ambitions. Why not realise your aspirations now?

Our expansion programme for 1979 calls for additional

Sales Representatives

to move into five existing territories —

BRISTOL, LANCS, HERTS & BEDS, ESSEX, LONDON (South West Postals), HANTS.

If you are ambitious, enthusiastic and imaginative you could join our highly successful sales team, selling a range of business forms and allied products to computer users.

You will have either previous selling experience or a data processing/ O & M background plus the maturity to negotiate at all levels.
In-depth sales and product training will enable you to achieve a high earnings potential (consisting of good basic salary and commission structure).
A company car is provided and you will also enjoy the full range of employee benefits associated with a progressive company.

Applicants, male or female, should write giving concise details of age, employment record and present salary to:

Field Sales Manager,
Wilkes Business Forms Limited,
Oxford Street, Bilston,
West Midlands.
Tel: (0902) 42951

Wilkes

Queen Mary College
University of London

DISTRIBUTED ARRAY PROCESSOR

The prototype ICL DAP will be connected to the QMC 2980 computer in July/August 1979. A DAP Support Unit is being formed in the Computer Centre to foster research on the use of the parallel machine, produce software, advise users and act as a focus for information. The Unit, to be financed initially for four years, will be led by Professor D. Parkinson, on part time secondment from ICL. There are vacancies for the following:

Project Leader, salary range £7508 (9283 p.a. plus £460 London Allowance, to control day-to-day work of the Unit and deputise for the Head in his absence. 1 Senior Programmer, salary range £6317-£7754 p.a. plus £460 London Allowance. 2 Programmers, salary range £3881-£6556 p.a. plus £460 London Allowance, to work in the areas: advisory and training, DAP software writing and support and system support. All salary ranges are under review. Suitably qualified persons are invited to seek further details from: The Registrar (CW), Queen Mary College, Mile End Road, London, E1 4NS, within 14 days of the appearance of this advertisement.

THANET JOINT COMPUTER COMMITTEE SYSTEMS ANALYST/PROGRAMMER
£4,773-£6,888 p.a. Ref. (APS/601)

The Committee operates a Honeywell 62/40 on behalf of the Thanet and Dover District Councils and consideration is being given to the use of on-line applications by both user authorities. A suitably experienced person is required, to assist in improving existing systems and developing new systems.
Applicants should preferably have a sound knowledge of systems analysis and programming, in COBOL.
Consideration will be given to housing accommodation and a generous disturbance allowance scheme is in operation.
Applicants giving full details of experience to date to:
The Computer Manager
Thanet Computer Centre
Hawley Road
Ramsgate, Kent CT12 5AA
by 28th February, 1979.

USER SUPPORT PROGRAMMER

The Daresbury Laboratory, located in the Cheshire countryside, is developing major national facilities for research into atomic, molecular, solid state and nuclear physics. Exploitation of these facilities requires first class computing support. Computers at the Laboratory include an IBM 370/165, GEC 4070's, PDP 11's and Interdata's.

We are looking for young people, male or female, to fill vacancies in the User Support Group which is responsible for providing general support for users of our computing facilities. Previous experience of computing whilst advantageous is not essential as training will be provided.

Appointment will be made at one of two levels depending on qualifications and experience:

(a) Scientific Officer — applicants should possess a good honours degree in a relevant subject.
Salary: fixed according to qualifications and experience on the following scale: £2,839-£4,415.

(b) Higher Scientific Officer — applicants should possess a good honours degree in a relevant subject, plus at least 2 years post graduate experience.
Salary: fixed according to qualifications and experience on the following scale: £4,101-£5,448.

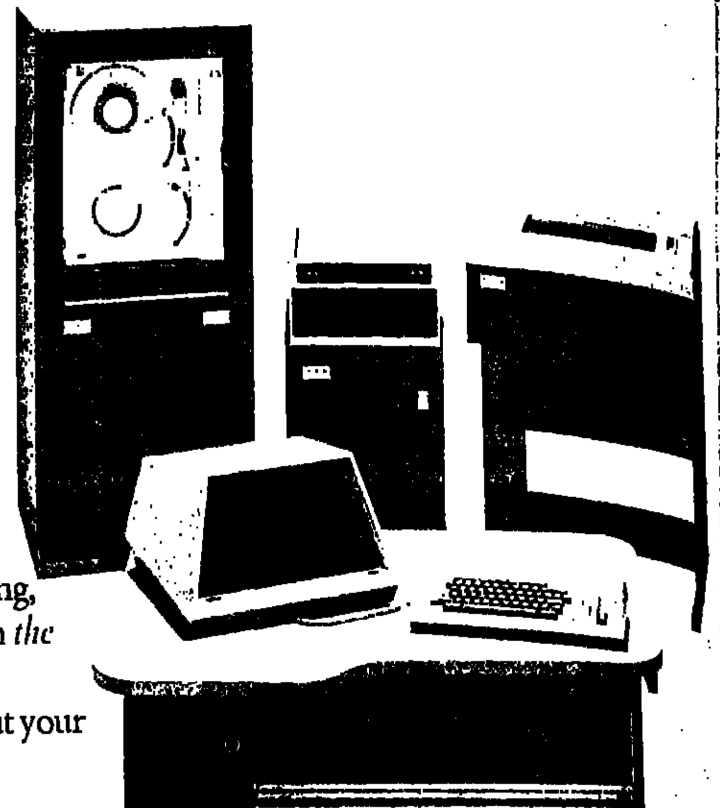
There is a generous leave allowance and a non contributory pension scheme for both grades. The Laboratory also operates a flexible working hours scheme.

Closing date: 23rd March, 1979.

Application forms can be obtained by telephoning Warrington 65000 Ext. 467 or writing, quoting reference number DL 6607/W to:

The Personnel Officer
DARESBURY LABORATORY
Science Research Council
Daresbury, Warrington WA4 4AD

REDIFON NEEDS MARKETING PEOPLE



Redifon Computers, the second largest British-owned Computer manufacturer, is starting a major new expansion programme. This will complement an existing programme that has led to eightfold growth in the last five years.

Career-minded people are now needed throughout the U.K. for marketing appointments.

Are you eligible?

2 years' successful experience selling computers?
Good educational background?
Currently earning £9,000–£10,000 p.a.?
Clean driving licence?
Ambitious?

Tick the questions. If you score 4 out of 5 you could be selling the R-Range of data entry and distributed data processing computer systems within months.

More than that, you could be established in a fast career development plan – backed up by thorough sales, marketing, technical and management training – with *the* British company.

Don't miss this opportunity to talk about your future. Call today:

Phil Northeast. Tel: 01-680 4756.
London/South/East Anglia/West Country.

Barry Roberts. Tel: 01-499 6791.
Major accounts and Financial Institutions in all areas.

George Snelgrove. Tel: 061-436 4114.
Scotland/North/Midlands.

REDIFON
COMPUTERS LIMITED
with you all the way

Member Company of the Rediffusion Organisation

Camden's Growing! Get in Now

with an exciting new development programme. We are recruiting extra staff for our 1902T installation. Fourth generation equipment is now being evaluated, once an order is placed full training will be given to all staff.

Project Leaders
(2 posts)

To lead teams of up to seven analysts and programmers. Responsible for the analysis and design of a project through to implementation. Three years' systems experience minimum required. Salary on a scale up to £7137 p.a. (incl). Ref. No. 1C/1C/CW

Senior Programmers
(2 posts)

A minimum of two years programming in COBOL or PLAN. On-line MAXIMOP/DRIVER an advantage. Duties include writing program specifications. Salary on a scale up to £6,003 p.a. (incl) Ref No 1C/9CW.

Programmer
(Career Grade) (2 posts)

A minimum of one year's programming. Salary on a grade up to £5508 p.a. (incl) depending on experience and ability Ref. No 1C/8/CW

We are a friendly unit, working on widely varied applications. located at just about the easiest travel spot in London — King's Cross. All the generous benefits and security usually associated with local government employment including season-ticket loan scheme, flexitime, etc.

For application form please telephone our 24-hour recruitment answering service 01-837 9988 or send postcard to the Chief Executive, London Borough of Camden, Town Hall, Euston Road, London, NW1 2RU, stating post and appropriate reference number.

camden – an equal opportunity employer

Applicants are considered on the basis of their suitability for the post regardless of sex, race & marital status Also registered disabled persons with the necessary attributes are welcome to apply

FIELD SERVICE ENGINEER
Start £5,500 plus car plus London Weighting plus O/T

A market leader in the Mini-Computer Systems field is expanding in this country and abroad. The growth has lead to new opportunities in LONDON, HOME COUNTIES and MANCHESTER.
You will have the chance to work with a first-class, friendly team, on Mini Computers with an international reputation and to earn the rewards and recognition that go with career progress you will enjoy training and experience on modern, powerful computerisation — meeting people — solving problems on your own initiative and superb financial benefits. Start £6,500, paid overtime, London weighting, company car, non-contributory pension scheme. Call today but hurry Ref. E.K.2148 (Consultants)

AB EXECUTIVE (KINGSTON) LTD. 01-546 9473

Engineers and Programmers

Join a firm that cares for its staff, offers good career prospects and helps you exploit your abilities. Do satisfying and interesting work on defence projects, including:

Avionic Digital Systems

Applications are invited for a variety of posts:
***Project Management *Systems Analysis**
***Electronic, Logic and Mechanical Design**
***Programming**

Avionics experience would help but is not essential. Posts are available at our existing premises at Bracknell and Cwmbran and are open to male and female applicants.

Please write, or 'phone, for an application form to:
The Personnel Department, Ferranti Computer Systems Limited, Western Road, Bracknell, Berkshire RG12 1RA.
Tel: Bracknell (0344) 3232. Please quote ref. no. G/10/CW

FERRANTI
Computer Systems

SYSTEMS ANALYST
Real-Time Planning

London up to £6739

The Environment
A Systems Planning section responsible for the development of a large real-time telemetry system which assists in controlling the National Natural Gas Transmission Grid.

The Job
Defining and documenting in detail the plans for the development of the system and its software, for up to 5 years' ahead.

The Person
- At least 'A' level, preferably an Honours degree in a Mathematical/Scientific discipline.
- Several years' programming and analysis design of real-time process control systems is essential.
- Some knowledge of large computer systems is desirable.

Salary range £5253 – £6237 plus £502 Inner London Weighting plus current self-financing productivity payment.

If this post interests you please ring David Pyatt on 01-831 6272 ext 4192 or write giving full details of age, experience, qualifications and current salary, quoting HS/616901 (705)CW, to the Senior Personnel Officer (Hinckley), British Gas, 59 Bryanston Street, London W1A 2AZ.

BRITISH GAS

AMPEX
COMPUTER SALES ENGINEER

Ampex, world leader in the manufacture and marketing of a complete range of memory systems and media, needs an additional sales engineer in the Computer Products Department based at Reading. The applicant should be sales oriented with a background in computer peripherals and/or systems. *The job is to sell mini computer*, magnetic disk, tape and core memory products throughout the United Kingdom.

An excellent salary with sales incentive scheme and company car are offered, together with comprehensive Pension and Permanent Health Schemes.

Please apply for application form to Clive Legg, Personnel Manager, Ampex Great Britain Limited, Acre Road, Reading, Berks. Telephone Reading 85200.

DATA PROCESSING MANAGER
Required by
FLEMING HOWDEN LTD.

Continued expansion in food manufacturing and wholesaling has made it necessary for Fleming Howden Ltd. to install a computer. This is an outstanding opportunity for an analyst/programmer to install and run an IBM S34 computer supporting local and remote visual display units. We would like to hear from applicants who have been analysts/programmers possibly in a main frame system, who have HNC/Degree level education and some accounting systems experience. An attractive remuneration package including a Company car will be available to the right candidate. Assistance will be given with relocation expenses. Fleming Howden is a medium sized private company employing 150 people, located near Edinburgh, with branches in Aberdeen and Kirkcaldy, supplying the bakery, catering and allied trades. Please write for an application form to Personnel Officer

Fleming Howden Ltd.
Newbridge Industrial Estate Newbridge
Midlothian EH28 8LB

SENIOR ASSISTANT S.O.1
MANAGEMENT SERVICES — SYSTEMS SECTION
£5,232 £5,568 p.a. including supplement

Will generally assist the Systems Officer in investigating Departmental procedures for computerisation purposes. Assist in the [illegible] systems and procedures where new areas of work are [illegible] Investigate generally into new office machinery and systems. [illegible] ship of a project team with City Treasurers Systems [illegible] connection with the Departments Computerisation Programme.

Applications in writing from suitably qualified persons [illegible] Housing Officer, Bush House, Broad Street, [illegible] received not later than the 5th March, 1979.

ENGINEERS·PROGRAMMERS·SYSTEMS ANALYSTS·OPERATORS

"The ladder to success is through selling"

"Get into sales, get to the top"

"Most top people started in sales"

It's true, we've proved it!

Many of our friends now Company Directors/General Managers, began their career as an Engineer or Programmer, and owe their position today to a successful sales record.
Have you considered a sales career? You will need two important ingredients; the will to succeed and an organisation prepared to provide professional training. We have the experience to identify **your sales potential**, and a client prepared to offer formal training to enable you to capitalise on your potential.

Our clients are a multi million ££ BRITISH company — MARKET LEADERS in their field — enjoying outstanding business growth.
The investment they are prepared to make in your future include: a base salary of at least £5K, substantial income guarantees, company car, and an income potential of c. £15K after training.
You should be aged between 22 and 35, articulate, numerate, and "open minded" enough to talk to our career adviser for an immediate assessment and, if successful, an introduction to our clients.
Telephone immediately for a discussion — Ref. DS-4.

Insight Marketing & Personnel Consultants Ltd.
72-75 Marylebone High Street. London. W1M 4AJ
Telephone: 01-486 5644

ANALYST/PROGRAMMER
POWER STATION SIMULATION, LEEDS

The North Eastern Region of the Central Electricity Generating Board designs Real Time Operator training simulators of power station plant at their premises in central Leeds. The simulators are for installation in Electricity Authorities both in the United Kingdom and throughout the world.

IF YOU HAVE:
A sound working knowledge of FORTRAN.
The ability to communicate effectively with engineers of other disciplines.
BCS Parts I and II or an appropriate degree.
A broad interest in engineering.

WE ARE OFFERING:
"Hands-on" operation of a large, mini-computer.
Opportunities for home and international travel.
The opportunity to broaden your knowledge and experience.
The opportunity to develop your own ideas from concept to implementation.

SALARY RANGE: £4231 to £6215 p.a. Point of entry depending on qualifications, experience and training.

HOW TO APPLY: Please write giving brief details of qualifications, experience and salary to:

The Regional Personnel Manager, Central Electricity Generating Board, North Eastern Region, Beckwith Knowle, Otley Road, Harrogate HG3 1PS. quoting reference SVN/80/CW. Applications should arrive not later than Thursday 1 March 1979.

CENTRAL ELECTRICITY GENERATING BOARD – NORTH EASTERN REGION

LONDON BOROUGH OF HAVERING
Borough Engineer and Surveyor's Division

SENIOR ENGINEERING TECHNICIAN
Grade Tech 4/5
£4530-£5358

Applicants should have HNC in Civil Engineering or a recognised equivalent and have experience in working in a transportation team, report writing and in using a transportation package including the running of computer programmes.
Assistance with temporary housing accommodation and removal expenses will be considered.
Application forms and further details from the Borough Engineer and Surveyor, Technical Offices, *Spilsby Road, Harold Hill,* Romford, Essex RM3 8UU to be returned by Friday, 9th March, 1979.

Systems Analysts

We are
—The Computer Services Division of the Bank providing On-Line and Batch Services to 400 branches as well as to Head Office Departments and Subsidiaries
—Currently processing on 2 X IBM 158's, 1 X IBM 155
—On the threshold of extensive new developments
—Due to occupy a new purpose built computer centre in Mid '79

We offer
—The opportunity to work hard in one of Europe's most beautiful cities in congenial surroundings with professional colleagues
—Starting salary not less than £4,953 and (where appropriate) attractive House Purchase Facilities
—Non contributory pension scheme
—22 days holiday
—Continuing training
—Flexible working hours

We require
—A Degree or equivalent Professional Qualification
—A minimum of 2 years experience in the investigation, design and implementation of commercial D.P. systems

If you are interested, write for an application form to:

Mrs. M.C. Pinkerton,
Assistant Staff Controller,
Bank of Scotland,
2 Robertson Avenue,
EDINBURGH EH11 1PZ.
Telephone: 031-337 2488 (extension 186)

BANK OF SCOTLAND COMPUTER SERVICES DIVISION

OPERATIONS
SUPPORT OFFICER
SALARY TO £4581
NEW ICL 2970 INSTALLATION

Applications are invited for staff to join our newly created Computer Services Division which will house a 2 megabyte ICL 2970 planned for installation in the near future.

The successful candidate will have a sound Operations and Technical background, with the ability to communicate with Users and System Development staff.

He/she will be responsible to the Operations Support Group Leader for providing technical backup to the Operations Section in a high pressure installation. Ideally applicants will have experience of working in a large multi programming environment.

This post carries a Contributory Pension

If you are an ambitious person keen to develop your technical and personal skills, telephone 01-701 2870 anytime (24 hour service) or write to: The Personnel Officer, London Borough of Southwark, 27 Peckham Road, London SE5 8UB. Quoting ref: CW/8/9065 and job title Closing date 8.3.79.

Southwark

COMPUTER CAREERS IN AUSTRALIA
Challenge!

For details and brochure write to Computer Careers in Australia Agent-General for Victoria. Victoria House, Strand, London WC2B 4LG.

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday. Ring David Abbey for further details on 01-261 8016.

JBA

Systems Consultants

London based **up to £9,000**

Our client, one of the largest systems houses in Europe, wishes to recruit a number of Consultants to work on the development of commercial and communications systems.

Candidates must have at least five years experience in the design and development of applications preferably in finance or production. Recent experience with teleprocessing systems on large ICL 2900's or Honeywell L66 would be a distinct advantage.

The company offer the chance to work with professionals on sophisticated projects in a number of locations throughout the UK and the Continent.

Contact: Jim Baker

Computer Manager

London SW1 **£8,000 – £9,000 + car**

This well known and highly successful international publishing house is about to embark on a new phase of d.p. development, involving the installation of new mini computers to deal initially with subscription and accounting systems.

Candidates must have a sound background in systems analysis and design, together with a minimum of two years experience in project management. Technically, expertise must cover recent use of mini-computers and include a good understanding of communications.

An excellent package is offered, including free life insurance and BUPA, special mortgage arrangements to help with relocation and a superb pension scheme.

Contact: Andy Wright

Senior Programmer

Berkshire **up to £7,000**

Our client, a well established and profitable group within a large organisation, is developing a financial planning system and has an opportunity for a Senior Programmer to join the project.

Applicants should have at least four years experience in financial applications, preferably using COBOL and PLAN, and be capable of taking responsibility for one part of a project.

Salaries are negotiable according to experience. Large company benefits including bonus and relocation assistance.

Contact: Jim Baker

Systems Analysts

Covent Garden **to £8,000 + Bonus**

Our client is a major oil-drilling services company, with over 4,000 field technicians operating in 55 countries world-wide and an annual turnover which is increasing by 25%+ per year.

Analysts with a sound business systems background are required to join a small team, with an IBM 370/125 under DOS/VS due for upgrading in the near future – and a T.P. link to Paris, which is about to embark on developing a completely new range of Financial Systems. Each analyst has complete project responsibility from feasibility through to implementation.

All usual big company benefits apply a superb bonus scheme, plus non-contributory pension scheme

Contact: Andy Wright

(Junior) Systems Programmer

Surrey **up to £7,000**

This organisation now have their IBM 3032 installed and running under VS1 with plans to introduce MVS within one year. This presents an ideal opportunity for a systems programmer, with around two years good IBM experience, to move onto the latest range of equipment and obtain valuable further training. Applicants should be familiar with performance orientated products and have a good understanding of SYSGEN and operating systems. The successful candidate will enjoy an environment of self-defined job responsibility and every encouragement to progress in their career.

Convenient location. Realistic salary, and excellent fringe benefits.

Contact: Mike Creamer

Software Development Programmers

Sussex **to £7,500**

A progressive and fast growing manufacturing company is seeking to appoint additional software designers to augment a small development team. The requirement is for hardworking individuals who can make an immediate and significant contribution in this technical environment. Our client is interested in people who can demonstrate experience in the design of compilers, operating systems, data entry applications or communications systems. Virtually all development will be in a high level language therefore experience in ALGOL, BCPL, CORAL or PASCAL is relevant. A sound knowledge of Assembler would be a distinct advantage.

This is a first class opportunity to progress with a highly successful organisation.

Contact: Margaret Stevens

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

GEORGE II OPERATORS...

.....move to ICL 2960's in West London C. £4,300

One of the major UK breweries have recently installed two ICL 2960's, which will replace the existing hardware of two ICL 1903T's running under GEORGE 2S.

As one would expect from a major brewery conditions of employment are first class and include:

- ★ **start salary of c. £4,300**
- ★ **excellent restaurant**
- ★ **ample car parking**
- ★ **first class career opportunities**
- ★ **FREE BEER of course!**

Three operators with upwards of one year's operating experience on ICL 1900 mainframes, running under GEORGE 2, are required to complete the existing operations team. Three shifts are worked and with the arrival of the 2960's, prospects for career advancement are excellent.

For further information (including a data sheet describing our clients installation) contact REX SCOONES at our CROYDON office.

Positions open to male & female applicants, please telephone (24 hour service) for initial discussion or write to address below.
QUOTE REF: CW 109-9S.

Please write new address same phone number

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS

CAPP ASSOCIATES
LONDON AND MANCHESTER

Computing Services Association

01-686 9693
A.M.P. HOUSE, DINGWALL RD.
CROYDON, CR9 2AU

SALES EXECUTIVES P.E. £15,000 up + Car

Join in the success of this leading Mini Computer Manufacturer

The Company is a leading manufacturer of computing equipment it has a specialised division for the marketing of its range of mini-computers and terminals, and this represents the fastest growing sector of its business. As a result, 1979 will see the doubling of the overall size of the marketing force.

The products are established and have enjoyed a very high level of market acceptance, being competitively priced and technologically advanced. The supporting Software matches the standards of the Hardware. Other elements of customer support — e.g. field engineering and demonstration/testing facilities — represent further strong points.

Sales are made either directly to end-users or through distributors and systems houses. Direct end-users generally place multiple orders for the development of their teleprocessing networks. Systems houses tend to purchase singly for discrete customer applications.

Hutchinson Scoggins has been assigned to recruit four Sales Executives with the calibre to handle the enormous demand. These are situations offering an exciting challenge in the short-term, coupled with outstandingly good future prospects.

Compensation will be by way of high basic salary and a highly geared commission scheme. The range of benefits includes a car for which all expenses will be paid by the Company.

Contact: TONY BAKER on (01) 499 4501 (01-445 3512 out of business hours) as soon as possible.

SALES EXECUTIVE– END-USER SALES

The individual appointed to this position will have several years' successful experience of high-level D.P. selling, probably involving medium to large mainframes. Located near London, his task will be to make a major selling impact on large companies already heavily committed to computing. This will involve dealing with top technical and general management, and contributing to the corporate development plan.

RW 8/1

SALES EXECUTIVES– DISTRIBUTOR SALES

1. **EAST ANGLIA**
2. **EAST MIDLANDS**
3. **CENTRAL/SOUTHERN SCOTLAND**

Three successful sales executives are required to generate high-volume sales by developing existing systems builders and identifying and encouraging new ones. The jobs therefore require executives with an entrepreneurial spirit and a high ambition to succeed. All territories have big potential and the company will invest heavily in training — success, therefore, should not be long in coming.

RW 8/2

CALLING ALL SUCCESSFUL

CONTRACTS SALES PEOPLE

DOES YOUR FUTURE MATCH THIS?

Opportunity to

1. Become the Managing Director
2. Enjoy equity participation
3. Build an organisation
4. Run the company your own way.
5. Make a LOT of money.

To qualify you need an excellent track record selling contract services and to be a self starter totally motivated by success.

WARNING

This is no sinecure. Do not apply unless you have boundless industry and determination to succeed.

Call: DAVID J. HUTCHINSON on 01-499 4501 for a very confidential discussion.

RW 84

SOFTWARE PEOPLE

Real-time systems employing PDP/11S and Micro-processors

£ Negotiable plus Relocation costs

This is a small, intimate company, heavily funded by its parent organisation, a leading British industrial group. It thus provides an ideal working environment, coupled with financial stability and security.

The people that are wanted will have experience with high-level or Assembler languages, preferably on **PDP11s** with **RSX11-M,** but other relevant experience may be useful. They will join this small team employed on the development of a wide variety of real-time control systems.

The jobs are based in Berkshire. You will be surrounded by stimulating colleagues and have access to abundant in-house computing facilities. With increasing use being made of micro-processors (especially **LSI-11, Intel 8085** and **RCA 1802**). There is every chance to enlarge your professional experience.

Applications please, by phone or letter, to **TONY BAKER at the address at the bottom of this page, (01-499 4501).**

REF. RW 8/3

hutchinson-scoggins recruitment
47/48 New Bond Street (Entrance in Maddox Street)
London W1Y OHE Telephone 01-499 4501

OCC

Specialists since 1971 in UK and International computer appointments. We have many other jobs on our files and offer a career counselling service to computer professionals

London

Consultants and Project Managers	£6,500–£9,500
Analysts	£5,500–£9,500
Programmers	£4,000–£7,500

A major UK Software House is rapidly expanding its operation in the London area. The positions are based in London but there are also many other vacancies in Reading and Wilmslow.

The applications are generally commercial with a strong emphasis on financial systems. Opportunities exist to work on the development of Real Time Systems.

Senior candidates should have extensive experience in commercial systems development or may be specialists in an application or technical area.

Programmers and Analysts will work on a variety of computer systems ranging from medium size i.e. ICL 2903 to larger IBM or ICL systems.

To apply for any of the above positions, contact Renée Nute or Fran Setter on 01-242 9356 (day) or 01-874 6372 (evenings). Ref: 503/CW.

Informal interviews — Our clients will be at our premises on Tuesday, 27th February, 5.30-7.30

**OCC Computer Personnel Limited,
16 Bedford Row,
London WC1R 4EB.
Telephone: 01-242 9356**

Members of Computing Services Association

OPERATORS

Junior and Senior Operators with a minimum of 6 months' experience on any mainframe required urgently. Listed below is a small selection of current vacancies.

IBM	OS	Chief Op	3 yrs	£6000
IBM	OS	S/Ldr	4 yrs	£6000
IBM	OS	Snr Op	3 yrs	£5800
IBM	OS	Operator	2 yrs	£4600
IBM	OS	Operator	1 yr	£4300
IBM	DIS	S/Ldr	2 yrs	£5000
IBM	DOS	Snr Op	2 yrs	£5000
IBM	DOS	Operator	1 yr	£4600
IBM	DOS	Operator	1 yr	£4200
ICL	GII	Snr Op	2 yrs	£4500
ICL	GIII	Snr/Op	2 yrs	£4500
ICL	ANY	Operator	1 yr	£4200
ICL	GII	Operator	1 yr	£4000
ICL	2900	Operator	1 yr	£4300
DEC	PDP	Operator	2 yrs	£4600
UNIVAC	1108	Operator	2 yrs	£4200
UNIVAC	9400	Operator	1 yr	£3800
H'WELL	GCOS	Operator	1 yr	£3600

DATA CONTROLLERS, ALL AREAS £3000-£5000

TARGA COMPUTER SERVICES

**3 LIVERPOOL STREET
LONDON EC2M 7NH** **01-283 2751**

GO TO WORK ON AN "E"

with

VAN LEER (U.K.) LIMITED

A member of a major International Group of Companies specialising in the manufacture of Industrial Packaging

requires

**SYSTEMS ANALYST
Up to £7500**

**ANALYST/PROGRAMMER
Up to £7000**

**APPLICATIONS PROGRAMMER
Up to £6000**

Preferably with IBM experience including Cobol. Our U.K. computer department at West Byfleet, Surrey, intends expanding its development program with IBM 4300 hardware and over the next 2-3 years these include on-line interactive applications (financial and commercial) for Head Office and a number of manufacturing locations in the U.K.

If you would like to join a small successful team that is working closely with its users and would welcome an opportunity to make a real contribution to computer development in a progressive company then please contact

Brian Bicknell at Van Leer House, West Byfleet, Weybridge, Surrey (Tel: Byfleet 41161).

Full-time salaried

ONSITE CO-ORDINATOR

required for Midlands area of one of the country's leading Systems Houses.

For further details and application form write or telephone:

**Personnel Manager
F INTERNATIONAL LIMITED
The Bury, Church Street, Chesham, Bucks
Chesham 4999, quoting reference 78/W1**

EXPERIENCED SOFTWARE ENGINEER

Required by International company offering £7K. Usual large company benefits including pension scheme, four weeks holiday, career development plus opportunities for European travel. Applicants should have four years' experience with IBM OS hardware, the ability to modify an OS/VS operating system, knowledge of assembly language and of IBM OS utilities, facilities and JCL. French and/or German would be an advantage.

For early interview telephone 01-405 0664 quoting ref. JE/349, DRAKE SENIOR APPOINTMENTS (Consultants), 121 Kingsway, London, WC2.

Head of Computing
c. £13,000 – Reading

Thames Water, which manages all water services for some 12 million people, is the largest operation of its kind in the world. It makes extensive use of computers and at its Reading establishment is currently replacing existing ICL 1900 systems with a distributed processing network. This will comprise a large mainframe computer with linked processors at a number of locations to provide both conversational and bulk transmission services.

An Assistant Director (Computing) is now to be appointed to be responsible for leading a team of 50 engaged in the implementation of the new computer; conversion of existing systems and the development of new applications, particularly in the area of financial control, although other applications, including scientific, are planned. Responsibilities will also cover the financial and operating performance of the department; participating in internal policy groups and representing the Authority at national level on computing matters.

This appointment calls for a man or woman, preferably aged 35-4_, with a good degree and several years' experience of managing a large data processing facility including systems conversion and the implementation of systems using remote computer networks. Applicants should also have the sensitivity, commercial and technical awareness and communications ability necessary to negotiate computer policy with a variety of user groups. Some experience as a user of computer services would also be useful.

Salary will be negotiable around £13,000 per annum plus an excellent supplementary benefits package. If the challenge of managing a major investment in data processing interests you, write or telephone for an application form to Assistant Director (Personnel-Staff), Thames Water Authority, New River Head, Rosebery Avenue, London EC1R 4TP. Telephone: 01-837 3300 Ext. 2024. *Closing date for receipt of applications: 15th March, 1979.*

Thames Water

Systems Programmers — all levels

In order to develop our next generation of micro-computer based terminals we need innovative Programmers who are looking for an opportunity of applying their abilities to the design and development of complete systems.

Those abilities should include the capability of taking a product from initial concept through design and development into production.

Specifically, you will be involved on all of the following:

* Operating Systems
* Interpreters
* User Interfaces
* Maintenance and Diagnostic Routines

Previous experience in any of the above would be useful but not essential, enthusiasm, being the most important factor.

We are looking for Systems Programmers at all levels, from recent graduates to those with many years of experience who are looking for a new challenge.

Initially you will be based at Croydon although some travel will be necessary in order to fulfill your job responsibilities. Long term career opportunities exist both in the UK and overseas.

The compensation package will reflect the importance placed on these positions. Salary, in particular, will not inhibit selection of right persons.

Please write or call, Cliff Marks
Personnel Manager
Burroughs Machines Ltd.
512 Purley Way
Croydon, Surrey CR0 4NZ
Telephone 01-686 0355

Burroughs

UNIVERSITY OF LEEDS

SYSTEMS ANALYST/PROGRAMMER

Applications are invited for the post of SYSTEMS ANALYST/PROGRAMMER in the Office of the Registrar available from 1 April, 1979. Candidates should have a sound knowledge of Cobol programming and systems analysis experience. A degree and/or other relevant qualifications would be an advantage.

The successful candidate will play a major part in the detailed design, programming and implementation of financial and non-financial projects within the Administrative Computer Unit. This provides a wide range of data processing services to those members of the administrative staff responsible for student, financial and library record keeping. The present in-house machine is an ICL 1901 T but there are plans to enhance this facility and to develop on-line applications.

Salary on the 1A scale for Administrative Staff: £3384-£6555 (under review).

Application forms and further details of the post may be obtained from the Registrar, The University, Leeds LS2 9JT, quoting reference number 119/15/AZ. closing date for applications 12 March, 1979.

CONTRACT PROGRAMMERS REQUIRED

Send C.V. and data available to: Wedge Wood Software Services, Gimingham Rd., Southrepps, Norfolk NR11 8UY

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USA

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Informal interviews will be conducted in London in a few weeks. Appointments may be made by writing as soon as possible with a curriculum vitae to Payne Consulting Services Inc., 38 Coso Square, San Francisco, California, 94110, U.S.A.

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You should have at least two years' programming experience. Please write giving details of age, qualifications and experience including languages, hardware and application areas with which you have been associated quoting CW/24 to:-

Duncan Ross,
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The Electricity Council,
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Why don't you phone him on 01-953 2030, extension 3791.

Alternatively, write to: H. E. Batchelder, Marconi Avionics Ltd., Elstree Way, Borehamwood, Herts.

Please quote ref. MA 79016.

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UNIVERSITY OF SALFORD
Computing Laboratory

GRAPHICS PROGRAMMER

The University of Salford acts as lead site for GINO-F. The post involves support and distribution of the GINO-F package and associated satellite libraries to 1900 and 2900 universities throughout the UK. The post involves a certain amount of travel within the UK and is initially for a period of 1 year but an extension to July 1982 is currently under review.

Applicants should possess a good honours degree and knowledge of major graphics package. George II and George III or 2900 experience and familiarity with university computing services desirable but not essential.

Salary on scale £3883-£6555 (under review), USS superannuation. Ref. CL/63/CW.

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Required to assist the laboratory in the design and development of digital electronics services including microprocessor based systems. Applicants should have a degree in a relevant discipline and wide experience within the digital electronics field.

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Further particulars and application forms available from the Registrar, University of Salford, Salford M5 4WT, to whom completed applications should be returned by 8 March, 1979, quoting appropriate reference.

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The applications are generally commercial with a strong emphasis on financial systems. Opportunities exist to work on the development of Real Time Systems.

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Programmers and Analysts will work on a variety of computer systems ranging from medium size i.e. ICL 2903 to larger IBM or ICL systems.

To apply for any of the above positions, contact Renée Nute or Fran Setter on 01-242 9356 (day) or 01-874 6372 (evenings). Ref: 503/CW.

Informal interviews – Our clients will be at our premises on Wednesday 21st February – 5.30-7.30.

OCC Computer Personnel Limited,
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Telephone: 01-242 9356

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DEPARTMENT OF MANAGEMENT SCIENCE

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Applicants should write giving details of age, education, experience and naming two referees, to

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Applications, together with the names and addresses of two referees, must reach the undersigned by 2nd March 1979. They will not be acknowledged prior to the selection of candidates for interview. Canvassing will disqualify, and candidates related to any Council member or senior officer must so indicate.

Council Offices, St Asaph, Clwyd LL17 0RN — R STEWART JONES, Borough Secretary

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Applicants should have a good mathematics background and at least three years' computing experience including a thorough knowledge of FORTRAN and involvement in a substantial programming project. Training in Statistics would be an advantage.

Salary will be at an appropriate point on the Research and Analogous Scales (£3,384-£7,754) with USS benefits.

Further particulars may be obtained (quoting reference L.118C) from the Establishment Officer, University House, Lancaster, LA1 4YW, to whom applications (6 copies) naming three referees, should be sent not later than 26 March, 1979.

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The Fellowship will be tenable for a period of up to three years and may be extended up to a period not exceeding five years. The stipend will depend upon the age and experience of the candidates selected within the broad range £4,500 to £7,500. (The stipends are currently under review). The Fellowship will carry the superannuation provisions under the SRC Principal Superannuation Scheme which is a non-contributory scheme. Candidates will normally be expected to take up the posts in October 1979.

For details of Research Fellows' rights at the two Colleges and application forms, write to the Personnel Group of the Rutherford Laboratory, Chilton, Didcot, Oxon OX11 0QX quoting reference No. VN 730.

The closing date for applications is 16th March, 1979.

RUTHERFORD
Science Research Council
Rutherford Laboratory, Chilton, Didcot, Oxfordshire OX11 0QX. Tel Abingdon 21900

Systems Analyst
Development Role
Insurance Industry

Our client, the City based subsidiary of a Company long established in the Insurance world, wishes to update and broaden the scope of its present fairly simple Computer system and to become self-sufficient in the matter of specialist staff. To this end a Systems Analyst is sought; with the skills and experience to analyse the requirements, specify the systems, recommend new equipment, supervise its installation; introduce the new systems and supervise programme maintenance. (Programmes at present are written by a Software house.) Additional staff will be recruited when the need arises and could include programming.

This is a new appointment, responsible to the Company Secretary and will be a demanding and progressive responsibility. It will need at least three years of both programming and systems work preferably in the Insurance Industry. The likely age range is 30-35.

The salary will be negotiable to interest the right calibre of applicant and will be accompanied by attractive fringe benefits.

Applications please to: Mr. D. G. Wright who is advising on this appointment. Reference 459.

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BUREAU SALES — N.E. LONDON SALES MANAGEMENT POTENTIAL	Our client is one of the largest established in the field of bureau services. Having recently set up **new bureau** facilities in the Home Counties area of London, they are looking for experienced sales executives to cover the **N.E. area of Greater London.** An experienced sales person could be considered for a **sales management position.** Ideally, applicants should be familiar with a variety of business areas, plus computer applications, and [illegible] sales situations. The remuneration package [illegible] in addition to new business, plus car and all business travelling expenses. Reference: 2219
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FACTS

for the ANALYST & PROGRAMMER

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- **For more information, or to apply: –**
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Lecturer 'A'

Systems Analysis & Design or Computer Science

A vacancy presently exists for a computing professional to join the staff of the Department of Computer Studies and make a significant contribution to the teaching and further development of his/her specialism at higher diploma and degree level

Applications are invited from suitably qualified and experienced graduates specialising in either Systems Analysis and Design or Computer Science.

Salary:

Lecturer 'A' £4,029-£7,110 Bar-£7,638

Placing on the salary scale will be according to relevant experience. Application forms and further particulars can be obtained from the **Establishments Officer, Glasgow College of Technology, Cowladdens Road, Glasgow G4 0BA.**

Application forms should be returned within 14 days of the appearance of this advertisement.

Edward Miller
Director of Education
STRATHCLYDE REGIONAL COUNCIL

Strathclyde Department of Education

UNIVERSITY OF EDINBURGH
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Applications are invited for the above post which is offered for one year in connection with an SSRC sponsored investigation into the optimisation of large programs on ICL 2900 series computers

The work will involve studying the interaction of the packages with the operating system and the reprogramming of sections of them. A computer science graduate would be preferred but other graduates with adequate programming experience will be considered

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Further particulars are available from the Secretary to the University, University of Edinburgh, Old College, South Bridge, Edinburgh EH8 9YL, to whom applications should be sent not later than 8th March, 1979. Please quote reference 5007.

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All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring David Abbey for further details on 01-261 8016.

BASILDON DEVELOPMENT CORPORATION
DEPARTMENT OF PLANNING & TRANSPORTATION

TRANSPORTATION PLANNER

A small team within the Department of Planning & Transportation is currently engaged on an interdepartmental study aimed at formulating a Transportation Plan for the New Town (present population 95,000, ultimate population 130,000) in its regional context. The team uses, via in-house terminals, several computer bureaux for transportation modelling, statistical analysis and data processing services, including the IBM Traffic Planning Suite and the LGORU 'Transept' public transport planning suite, both mounted at the IBM Warwick Data Centre.

The above post will involve all aspects of forward transportation planning, of both public and private transport, and computer-based statistical and information services as part of the continuous monitoring and updating of the New Town Master Plan. The successful candidate must be numerate and interested in the application of computer-based techniques although previous computing experience, while desirable, may not be necessary. A relevant qualification and the ability to analyse and communicate the essentials of complex issues will be required.

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For further information contact Tony Budd on the above number ext. 22.

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For full details and application form please apply, quoting ref. 32BX stating post concerned and giving details of age, qualifications and experience to:—

ODM

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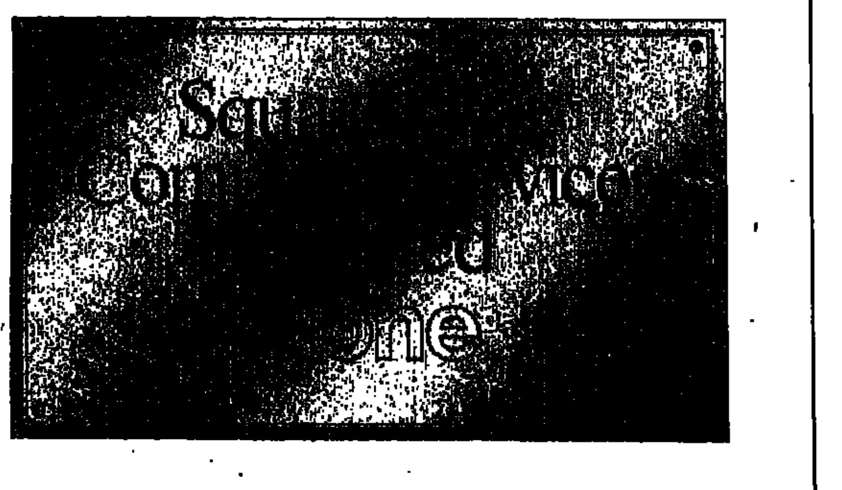

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Tony Knott, Recruitment Manager,
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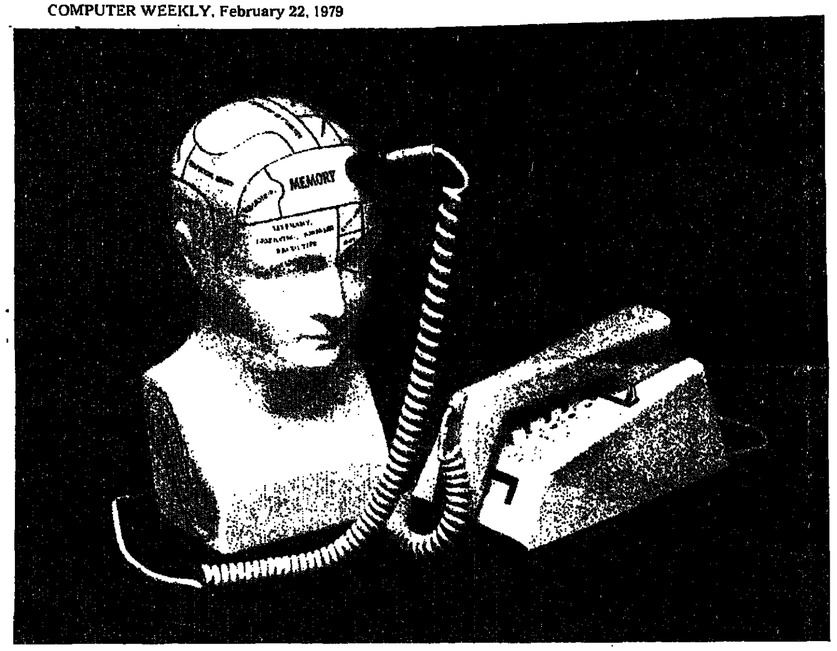

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THE SALES AND MARKETING BIT

FORECASTING—IV

The double barrelled approach.....

IN the three previous items on forecasting we have discussed the internal and external factors which, with varying degrees of emphasis, affect the compilation of the sales forecast. This article deals with some of the approaches to forecasting in which I have been involved predominantly in the services sector, but which I believe are just as applicable to the hardware market.

It is always a good discipline to have two different methods of tackling a given problem in the hope of verifying the initial answer by means of a different approach. From a sales forecasting point of view this double-barrelled approach is virtually the comparison of an external calculation with an internal opinion.

The external calculation is by inference a theoretical procedure taking into account the inherent trends of a particular market sector within a national or international environment.

This most basic and most commonly used methodology of all is simple extrapolation. The basic assumption of this approach is that the past has pre-determined the present, which in turn will dictate the future. The arithmetic progression of this approach is that expansion will continue at a consistent and pre-determined rate, ie a straight line on the sales graph. This method considers neither sudden expansion nor rapid contraction. It is the "wedge" forecast I referred to in the first part of this discussion on forecasting and the one that makes least sense.

However, exponents of this approach often attempt to overcome its inadequacies by a regulating device known as weighting. This approach attempts to estimate possible major problems which could have the effect of reducing sales, and the significant opportunities which might in contrast increase sales potential.

Trend analysis is also conceptually simple, but its application can be complex. The basis of information is historical performance over a period which is relevant to a particular industry or market-place. In the computer industry, demand and technology push things along so fast that some elements which are key factors today may not even have existed five years ago. In my experience 2/3 years is as far back as one can sensibly go.

Having decided on the historical timescale, a breakdown of total sales into key areas of sales activity is essential in order to identify the relative growth rates of all sectors. It is unlikely that growth (or even contraction) will be consistent.

The kind of divisions one might contemplate in a service bureau environment, for instance, might be by user/industry type and/or nature of service. The former could be as simple as commercial or technical, or there might be any number of sub-divisions.

The latter could be by batch, interactive, "over-the-counter," or package, bespoke programs, or whatever is appropriate to a given company situation. Other alternatives might be by sales districts or territories, key customers and so on — the main objective being to isolate possible "rogue" trends.

It is not inconceivable that an apparently satisfactory total growth rate might hide a severe decline within a product or territorial sub-division.

Having established these logical demarcations it is then necessary to identify particular trends. Almost certainly the monthly (or whatever) peaks and troughs of revenue will be such that they tend to obscure the curves of growth or decline they actually contain.

Such a numerical smoke-screen can be eradicated by the use of annual moving totals instead of bald monthly results. This process involves the creation of a graph where each individual plotting point is the total revenue for the one-year period prior to and including a given month, ie the plot for January is the total annual revenue from the previous February, February is the 12-month period from the preceding March, and so on.

This approach has the effect of smoothing the monthly fluctuations and revealing the overall trend. Trends are typically subtle, a little bit devious, but seldom obvious. It is only by meticulous ongoing analysis within a detailed revenue breakdown that they can be spotted before it's too late. Too late to exploit an opportunity, or too late to stay in business.

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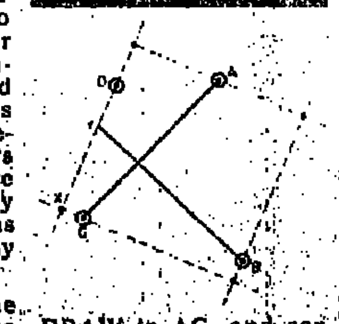
Puzzle Answer



DRAW in AC, and construct BY perpendicular and equal to it. YD extended in both directions must then pass through the centres of all squares on the left side of the board, and the other three centre lines can quickly be added. The dimension XC, marked off all round the perimeter, shows the board to be 9 x 9 in size.

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Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 27 (Block CAPITALS)

While Hex has fallen into the hands of the Error Squad, and Circ is down a mine shaft, Ascii has not been idle.

HEX left Ascii in the hills with the lethal gigotic induction program blasted into his PROM and instructions to proceed as fast as possible to Fort Ranfour.

Ascii ambled along for a while, sniffing the crisp mountain air, enjoying his jaunt. Now and then he paused to pay his respects to a particularly imposing fir tree. The sun was shining, and he was having a good time.

Suddenly everything changed. In characteristic slipshod fashion, Hex had left a zero off the end of the delay loop initialisation counter. In consequence, Ascii's warhead had been primed with a short fuse, and had gone off prematurely.

He tore off as if stung by a hornet. He just kept running. He ran up the critical path, down the audit trail, along the disc track and didn't stop running till he came to Route 66, the congested data highway that led into Fort Ranfour.

From the verge, he looked down on the traffic busily streaming in both directions, guided to its destination along invisible buried rails, each message tightly encapsulated in its own logical packet, oblivious of the outside world. Then in the distance he heard the distinctive melancholy hoot of a pulse train. He backed off slightly and watched as it rattled past, laden with its cargo of bits. There was a start bit on the engine, eight wagons piled high with data bits, and a stop bit on the guard's van bringing up the rear. It was the 1200 kilobaud express, dead on time. He listened to its rhythmic clatter recede into the distance.

On impulse, he decided to join in; and cantered along the embankment looking for the nearest slipway. Presently he came to a large toll gate. This was the logic gate through which he had to pass to get on to the data highway.

It was an impressive edifice, faced with marble. It consisted of three archways. The major one, in the centre, was barred by a heavy wrought-iron gate; but the two side entrances were open. Over the main arch the words "Abandon hope, all ye who enter here!" were engraved in bold Roman capitals. And from the top three gargoyles stared balefully down: they were busts of the three great logicians, Aristotle in the middle, flanked by George Boole and Bertrand Russell.

While he stood and stared in awe, the two guardians of the gateway sprang out into his path. They were grotesque. On two squat, round, seemingly human bodies perched dogs' heads, one looking like a great mournful St Bernard, the other a Pekinese with squashed-up features. Their clothing was luminous. The one on the left wore bright green trousers with a blue jacket. The other one wore blue trousers and a striped green top.

"I'm Peek," announced the Pekinese with the green trousers.

"I'm Poke," said the St Bernard on the right.

"You'll have to choose, you know," asserted Peek.

"This is a very exclusive OR gate," added Poke, "no fuzzy logic here."

"Once you're in, you're in," affirmed Peek. "If you get it wrong first time there's no second chance."

"Vice versa and conversely," echoed Poke: "once you're out, you're out."

"And you had better be quick about it," concluded Peek.

Ascii looked puzzled.

"I know what you're thinking," said Peek; "but it isn't so, nohow."

"Contrariwise," continued Poke, "if it was so, it might be; and if it were so it would be; but as it isn't, it ain't. That's logic."

Ascii wondered what would happen if he made the wrong choice.

"If you try to enter through the exit, the penalty is underflow," stated Peek ominously.

"Otherwise," exclaimed Poke, "it's overflow if you leave through the entrance."

"Bitwise," growled Peek, "it's logical negation for you if you exceed the time limit."

"Affirmative," barked Poke in counterpoint.

"Ditto," shouted Peek.

"Ditto, ditto," cried Poke.

Ascii hesitated.

"Come on then," urged Peek, "which is it to be?"

"Left or right?" asked Poke.

"Head or tail?" inquired Peek.

"It's now or never," declared Poke.

"Or else!" threatened Peek.

There was really no reason for preferring one way or the other.

"I'll give you a clue," offered Peek magnanimously. "It's cheating, but I'm in a good mood today. If you can solve this riddle, we'll tell you the right way."

"Riddles cost extra," added Poke gravely. "Difficult ones cost double. You can pay at the turnstile on your way through."

"Here you are then," said Peek; "what goes backwards and forwards, sounds like a bicycle, but never stops?"

Ascii was dumbfounded. It seemed a very hard one to him.

"I suppose you think that's too complex," said Peek, after he'd been silent awhile.

Ascii nodded.

"Well it isn't, you know. I'll explain: we define a thing as 'grue' if it is green on alternate Thursdays and turns blue at other times. We call it 'bleen' if it is blue on alternate Thursdays and green at all other times. It appears that these are very complex definitions. But it is really green which has a complex meaning. What we call 'green' is actually something that is grue on alternate Thursdays and bleen the rest of the time."

"Likewise," agreed Poke. "Look at my shirt for instance. Now do you understand?"

Ascii was as baffled as ever.

"I'd better give you another hint, then," said Peek. "You're not trying hard enough."

"Wait a moment," interjected Poke, catching hold of his companion's sleeve. He had just noticed something. "He's got the spots!"

Peek observed him intently. Ascii resembled nothing so much as 101 dalmatians. "Help!" he cried, "he's gone gigotic!"

Turning grue and bleen by turns with fear, the pair of them collided with each other, picked themselves up, and scattered in all directions.

Which door should he take? What goes backwards and forwards, sounds like a bicycle, and never stops?

© 1978, Richard Forsyth, Hair.

BOOK REVIEWS

Practical approach taught by example

A Practical Introduction to Pascal, by I. R. Wilson and A. M. Addyman. 144pp. £3.50. MacMillan Press.

THIS text on Pascal is described as being suitable for "beginners and experienced programmers" and happily achieves both aims by a practical approach which teaches by example.

The book begins with a refreshing introduction re-emphasising the use of diagrams as explanatory tools. These are chiefly the "bubble diagrams" used to describe the syntax itself, but later on blocks and stacks demonstrate the intricacies of scope and recursion. Chapter 2 gives the form of a program and basic calculations. It explains to the beginner that A:=1 is not a mathematic identity and that programs are executed "left to right and top to bottom," but does not labour the points. Chapter 3 completes the introduction by covering all five Pascal control structures. Equal weight is given to conditional and counting loops and a low key attitude is adopted to the goto.

The authors' experience in using Pascal is reflected in the accuracy and completeness of the more detailed discussions of variables, constants, expressions, input/output and procedures in Chapter 4, 5 and 6. These are matched by five excellent chapters on structured data types: files, sets, arrays, records and variants. Problem areas are pinpointed but the book avoids putting the blame on the language design. For example, the fact that the end of a list of numbers cannot be detected by eof is "a rather annoying little difficulty (which) has several possible solutions."

The weakest part of the book is Chapter 7 which is a dull enumeration of Pascal's scalar types; unadorned by any of the example programs present in other chapters and leaving the reader unimpressed by the real power of sub-ranges and symbolic values.

Chapters 13 and 14 cover advanced uses of procedures and the dynamic data facility. The text ends with a worked example of a fairly large program putting into practice the techniques of stepwise refinement and readable programming which were emphasised all along. The appendices include the full syntax of Pascal, answers to selected problems and (very useful) the address of the Pascal Users' Group.

Wilson and Addyman manage to put across the true spirit of Pascal in a slim, attractive and error-free monograph. I can recommend it for first courses in programming, as well as for individuals who wish to become acquainted with this language which is rapidly spreading in academic, business and, even, defence circles.

JUDY M. BISHOP
Witwatersrand University

Companies on the move

SUPPLIER of OEM printers and print mechanisms, Dataplus Ltd has moved its Cheltenham headquarters to larger premises at 20-40 Roman Road, Cheltenham, Gloucestershire GL51 8QQ. The telephone number remains the same, 0242 800300.

TO handle expanding business Langton Information Systems has moved into new offices at 138 Oxford Street, London W1R 1TD. Tel: 01-439 0366.

Limited readership

Denotational semantics, by Joseph Stoy. £14. Massachusetts Institute of Technology Press, 126 Buckingham Palace Road, London, SW1. Tel: 01-730 9208.

EVOLVED from a series of lecture notes for a graduate course given at MIT in 1973, this book is a lengthy and detailed introduction to the Scott-Strachey theory of mathematical semantics. Anyone who has read the expository paper by Tennent* and wants to know more is urged to read this book.

The fourteen chapters of the book take the reader through the relevant background mathematics (λ-calculus, lattices) and formal semantic descriptions of a progression of simple languages.

These languages increase in complexity and power causing earlier semantics to be revised to cope with the new situations. This constructive approach allows the reader to tackle each new concept almost in isolation to others and hence his task is made easier.

Eventually, in Chapter 12, the complete semantics of a non-trivial language is presented. The text is concluded by discussions on implementation and other semantic matters.

The prospective reader must be prepared to spend time on the many exercises and will need the mathematical maturity of a pure maths graduate.

Hence the readership will be limited (this is not a criticism of the text but is indicative of the gulf that exists between computing science practice and theory — teachers take note).

Despite its specialist nature the book is comparatively cheap. This has been achieved by photographing the author's typescript.

Dr. J. J. COOKE

*"The denotational semantics of programming languages, by R. D. Tennent. CACM 19(8), pages 437 to 453, August 1976.

Welcome addition to literature

An introduction to programming and applications with Fortran by T. E. Hull and D. D. F. Day. Addison-Wesley, Don Mills, Ontario, Canada.

THIS is not, as its name might suggest, an addition to the already excessive number of Fortran textbooks. Rather it is an introduction to programming and to problem solving as subjects in their own right and the realisation of programs in Fortran plays a relatively minor part.

In an academic context it would be suitable for the final years at school or first years at university and it could be recommended as self-teaching course for anyone who is likely to need a computer as a tool to help solve problems.

The book is divided into three distinct parts.

Part I describes the principles of computers, algorithms, including control structures and data structures. It emphasises the need for good practice in areas such as correctness, efficiency and documentation.

Part II contains a straightforward exposition of Fortran, showing how to render algorithmic constructs in the language, mentioning the coming of Fortran 77 and making the user aware of possible dialect problems. If anything, the authors are overcautious in their description.

There follows a summary of Fortran which has been printed on different coloured paper for easy reference.

Part III discusses the use of programs, not necessarily in Fortran, in various application areas. Two chapters discuss numerical calculations and error analysis and assume some knowledge of calculus and matrices.

Other chapters deal with the computations likely to be needed for elementary statistics, discrete simulations and "data processing" (i.e., file maintenance, sorting, decision tables, etc).

There is a mixed non-numerical chapter on graph theory, games, and [illegible] and a final one on interpreters and translators.

There are appendices on machine codes, assembler programming on a hypothetical simple computer and on number representation. A good index is provided.

The authors thoroughly understand their subject and have produced a book which covers a relatively wide area, which is usually well planned and which is a pleasure to read. It is a welcome addition to the literature.